

**TRANSPORT
AND
SOCIETY**

See Pages 2 and 7

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FARNBOROUGH

**AIR
DISPLAY**

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PRICE NINEPENCE

British Association Discusses Transport

UNUSUAL attention was given to transport at last week's annual meeting at York of the British Association for the Advancement of Science. In his presidential address to the engineering section Sir Ewart Smith, deputy chairman of Imperial Chemical Industries, in referring to the lag in technical development, said that even the projected expenditure of £60 million on new roads and major improvements was no more than the 1939 rate, allowing for the fall in the value of money, although the number of vehicles had grown from three to more than seven million and was increasing at 8 per cent per annum. By the end of the year only 64 miles of motorways would be in use, whereas from 1830 to 1850 new railway routes were being built in Britain at an average rate of 320 miles a year. Urban road development lagged even more. Although the savings to be gained from traffic engineering were immense there was at present no established centre for training high-grade traffic engineers. "An increase," he said, "of only five miles an hour in average speeds—at present 20 m.p.h. in urban districts and 32 m.p.h. in rural areas—would give an economic saving of at least £180 million a year, and much more as traffic grows." Sir Ewart considered that the true capital outlay on the railways between 1900 and 1955 was very small. He also compared the 1956 figure of 0.23 per cent for employees of the British Transport Commission who were qualified scientists or engineers with the 0.7 per cent of the Coal Board and the 2.9 per cent of the Central Electricity Authority and commended any measures to improve the ratio. Nevertheless it seems to us that in view of the proportions of railway and other transport staff inevitably engaged out on the road or in manual labour, the low ratio hardly seems surprising. Indeed, in view of its highly technical sphere, the quoted Atomic Energy Authority figure of 10.9 per cent might be subject to greater criticism.

Railway Traction

DISEL traction on railways has proved attractive because on suitable duties it can improve services and net revenue as soon as it can be applied, said Mr. E. S. Cox, assistant chief mechanical engineer, British Railways Central Staff, to British Association members. B.R. modernisation has resulted in there being 1,328 diesel locomotives and 1,547 power cars in service as at May last, with 1,675 more locomotives and 714 power cars on order. Experience so far has confirmed the thermal efficiency of the traction diesel engine as reaching 36 per cent, or 28 per cent at the locomotive wheel rim, this value being the same for electric or hydraulic transmission. Fuel consumption per engine h.p. does not vary appreciably between different types and sizes of engine, but figures for miles per gallon for complete locomotives differ widely and reflect traffic conditions more than they do relative merit between one locomotive and another. Representative figures now being obtained are from 72 per cent to 90 per cent of days available, and from 17 to 22 hours in service per day in use. In the best cases, diesel locomotive mileage is accumulating at a rate round 140,000 miles per annum, roughly half of the potential best when steam has been eliminated, but already nearly twice that of the best existing steam locomotive annual mileage. The gas turbine locomotive was mentioned, but so far it is lower in efficiency than the diesel at partial loads, and has, therefore, little application under British Railways conditions. A corresponding paper by Mr. S. B. Warder, chief electrical engineer, B.R., referred to the 25,000-volt 50-cycle a.c. system now adopted for the considerable electric traction projects north of the Thames. Items which Great Britain is pioneering in his new system of electrification include the automatic voltage change at speed without the assistance of the driver, silicon and germanium power rectifiers for a.c.-d.c. current conversion, and a new method of current collection.



"THE TIMES" OF THE TRANSPORT WORLD

CURRENT TOPICS

Road-Rail Transfer the Key

DEALING with the future of inland transport before the British Association, Mr. G. F. Fiennes, Great Northern Line traffic manager, Eastern Region, doubted whether motorways would increase speeds or reduce costs very greatly. He gave a vivid account of prospective technical development on the railways; this hinges upon higher operating speeds, means of overcoming disabilities such as road-rail transfers and elimination of damage in shunting. Road-rail transfer is the nub of the matter and key to the continued existence of the railway,

new bridges would be subjected during the next 100 years. For railway bridges that meant analysing the possible changes railway modernisation would bring; for highway bridges the engineers had somehow to guess at future trends in vehicle design and use.

Discussion Groups at Oxford

UNDER the chairmanship of Sir Reginald Wilson, immediate past-president, a well-organised and highly successful weekend study course was held by the Institute of Transport at Magdalen College,

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putting it into the door-to-door business for haulage of consumer goods. Railway advantages, hitherto thrown away in terminals and marshalling yards, may be turned to good account by further development of container traffic, with easier transfers or introduction of the piggyback means of conveying road vehicles by rail (difficult in the British loading gauge) or of an amphibian vehicle equally at home on road or rail. Combination of, or resiting of, marshalling yards and reduction in numbers of terminals (from 170 to 48 in one Region) will combine with such facilities to enable a transformation on the railways in reliability, in overall speed and in safety of enormous importance. Final thought was that the transport tap should not be allowed to run to waste to the detriment of the nation.

From Air Pollution to Bridges

AT York last week Dr. P. J. Lawther, director of the Medical Research Council group for research on atmospheric pollution, told the Assembly of Corresponding Societies that the possible hazards created by carbon monoxide from petrol engines may have been under-estimated in congested streets in stable air, while the widely publicised noxious properties of diesel engines had been grossly exaggerated. "There is certainly no evidence," he said, "to justify the popular belief that diesel engines produce lung cancer." He mentioned that during petrol rationing in the Suez crisis the carbon monoxide in the air in the City of London was barely measurable. During a normal rush hour it rose to 350 parts per million—3½ times the concentration permitted in factories. There was no significant difference in pollution when the diesel-engined London buses were off the road during the bus strike. Mr. O. K. Kerensky, a well-known authority on bridge design and construction, pointed out to the engineering section that one of the most important tasks was to assess the type and frequency of loading to which old and

Oxford. Based on the theme of the pattern of future demand for public transport it was introduced by Sir Reginald with some general considerations on the consequences of public choice and taste. In dealing with demand prospects for passenger transport Mr. Charles Klapper outlined forecasting methods from hunch to graph and, despite the difficulties, suggested investigation of the possibility of presenting the public with a more integrated layout of road and rail service, backing the facilities with corresponding information. Mr. Martin Brown covered freight traffic demands and, basing his estimate on a 22 per cent increase in the index of production in five years, anticipated a 15 per cent growth in the "traffic cake" in that time. The railways would only secure an adequate share of that by much more intensive selling. On consideration of costs Mr. D. M. Dear concluded that the minimum would often be represented by co-ordinated road and rail transits, while in elaborating the shape of supply Mr. D. L. Munby expounded and exploded a number of theories with the true aplomb of an economist. The value of such a study course must rest largely upon the work of the discussion groups and the questions they pose subsequently to the lecturers and in this the fullest benefit was to be perceived.

Air BP's Yorkshire Fueller

SHORTLY to go into operation with Air BP at Continental airports are a number of 10,000-gallon articulated fuellers, the first of which was formally handed over at the Southall works of A.E.C., Limited, by that company's chairman, Sir William Black, to Mr. C. Rees Jenkins, director of various British Petroleum overseas associated companies. Given the class name Yorkshire, the first vehicle comprises an A.E.C. Mammoth Major tractor, which also mounts the pumping and control equipment, and a Saunders-Roe semi-trailer tank of frameless welded aluminium-alloy plate construction. Various concerns have co-operated in

developing and providing new high-efficiency pumping, filtering and control equipment to meet the BP specification for a usable capacity of 10,000 imperial gallons and a delivery rate of 750 g.p.m., which very high capacity and performance are required to meet the refuelling needs of the big long-range jet aircraft, some of which have a total fuel capacity as high as 20,000 gallons. Even the intercontinental jets seldom require such vast quantities at turnaround and frequently it will probably be found that one 10,000-gal. fueller will meet their requirements. But even when a full load is needed, two Yorkshire units can supply it in about 15 minutes. Thus, while fixed-point hydrant fuelling of aircraft is being discussed and put into effect with advantage at some airports, the mobile fueller yet finds favour.

Outlet Wanted for Welsh Resources

OBJECTIVITY and the advocacy of dynamic change characterise the pamphlet *Work for Wales* published for the Bow Group of Young Conservatives. "The time for choosing between romance and realism," that is, between an uncritical bolstering up of local industries or accepting the need for new ones, is now for Wales, it says. In a chapter on transport the point is made that good communications are vital to overcoming the geographical handicap which the Principality suffers; Wales must export and import to and from England to survive since her native industries can no longer support a population of 2½ million. These through communications must largely take the form of road transport, say the authors; they apparently feel that British Railways, with its contracting physical system (a process which they endorse) will be primarily concerned with servicing the basic industries—coal, oil, iron ore, steel and tinplate—associated with the South Wales ports. But if Midland industrialists, to whom South Wales chiefly looks, are to be convinced of the manufacturing potential of that area a dramatic and comprehensive attack on road improvements is essential. The draft plans are there—widening of the Heads of the Valleys road from Ross to Neath, leading to Swansea, and of the spur via Usk and Newport, serving Cardiff, but they must be translated into early reality. Of course, the Ross Spur motorway cannot realise its full purpose until the West Midlands motorway to Birmingham is an accomplished fact. Neither the B.T.C. nor the commercial interests concerned have been conspicuously active in their efforts to revive the trade of Cardiff and Barry, claims the pamphlet. It urges a bolder and more enterprising spirit on behalf of these coal ports, whose traffic dwindled from 13½ million tons in 1939 to 4 million tons last year. That is the South Welsh tragedy of past over-specialisation.

Modernisation in Scotland

DESPITE pruning of railway facilities and workshops in Scotland in accordance with the terms of the re-appraisal document Sir Brian Robertson was able last week, before the opening of the Scottish Industries Exhibition by Princess Margaret, to point to the fact that despite the serious problems presented by Scottish conditions to transport undertakings the British Transport Commission was adopting a very bold forward policy in that country. Undeterred by the fact that the setback in the heavy industries, particularly coal, steel and shipbuilding, was gravely affecting freight traffic receipts, the Commission was intensifying its efforts to modernise and was showing faith in Scotland's economic future. Evidence lay in improvements at Glasgow Central, Dundee Tay Bridge, new marshalling yards at Thornton, Millerhill and Perth. Modern diesel trains were operating from the principal cities in increasing numbers. On the freight side the improvements had been even more important. They had just seen the new Glasgow suburban electric stock in its blue livery; services would start next year and play an increasing part in solving Glasgow city traffic problems.

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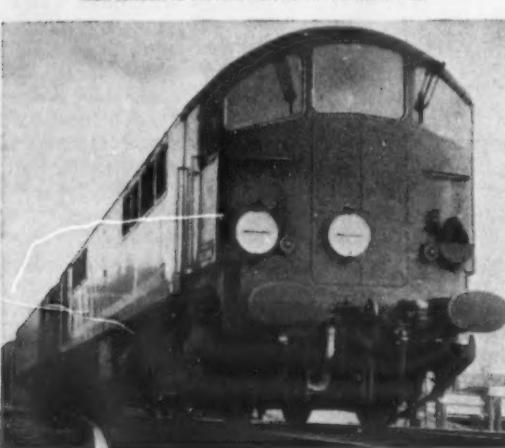
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The Editor is prepared to consider contributions offered for publication in MODERN TRANSPORT, but intending contributors should first study the length and style of articles appearing in the paper and satisfy themselves that the topic with which they propose to deal is relevant to editorial requirements. In controversial subjects relating to all aspects of transport and traffic this newspaper offers a platform for independent comment and debate, its object being to encourage the provision of all forms of transport in the best interests of the community.

Transport and Society

IMMINENCE of an election once more links transport with thoughts of the vicissitudes it may suffer from party politics. This week at the British Association meeting Sir Reginald Wilson discussed the mutual relationships of transport and the body politic or society as a whole. Transport concerns us all; as a community we all set the rules under which the transport machine works. As things are developing we have more traffic than track in Britain, but it is not enough to provide new track, both road and rail. With the most liberal provision of track there will still be circumstances in which congestion and delay will continue or worsen. Further capital investment must therefore be accompanied by a better understanding on the part of the public of the basic truths of transport economics, and in particular of the relative costs of providing the various kinds of carrying facilities and of the organisation and discipline required to maintain reasonable throughput over inevitably limited rights-of-way, road or rail. Sir Reginald suggested that society as a whole should pose the question: "Do we want public services?" and if an affirmative answer was arrived at, should decide what steps were necessary for their soundly based survival.

Work and Investment

ALLOWING for variations in quality of different ton-miles and passenger-miles, a rough guess could be made that one-third of passenger traffic was carried by private car and two-thirds by public transport. Perhaps, of that, some 50,000 million passenger-miles was carried by bus, mainly on short journeys around cities, and about 20,000 million a year by train, mainly in congested areas and on busy routes. The bulk of parcels went by rail, either through the Post Office or direct. In freight about one-third of the ton-miles was generated by private transport and the remainder by public, the railway producing about twice as much as the haulier. In this small and crowded island surface transport depends mainly upon 209,000 miles of right-of-way, of which about nine-tenths is ordinary road and one-tenth railroad. The latter, with great capacity and a routine discipline which holds down congestion, suffers the disadvantage of possibly involving road transit at each end of a journey. The conflicts of interest between public and private transport become entangled with the controversies between road and rail and particularly which is, or could be, the more economic carrier and therefore more deserving of endowment by society with new and better rights of way. Claims for investment come to some £7,500 million if the views of the Conference on Highway Needs (1957) are accepted that £3,500 million should be spent on roads. For road vehicles some £3,350 million is due to go on replacement and betterment; for garages and workshops perhaps £150 million. On the rail side

NEWS SUMMARY

PAPERS at the meeting in York of the British Association for the Advancement of Science have included a considerable amount of attention to transport. Reference is made to some highlights on page 1; Sir Reginald Wilson's outstanding contribution on transport economics is the subject of reference above and on page 7. An abstract of the paper by Mr. G. F. Fiennes on future freight developments appears on page 13.

Sir Ian Bolton, part-time member of the B.T.C. and chairman of the Scottish Area Board, is retiring and will be succeeded as chairman of the Scottish Area Board by Mr. Donald Cameron of Lochiel.

A 10,000-gal. mobile fuelling plant for jet aircraft by Saunders-Roe, hauled by an A.E.C. Mammoth Major tractor, has been placed in service by Air BP after a handing-over ceremony by Sir William Black, chairman of A.E.C. Limited. See page 5.

Brian Robertson introduced a preview of

the modernisation plan envisages £50 million on track, £125 million on betterment upon replacement of existing fleets, less disinvestment, and £325 million on signalling, electrification and depots—or a net 7 per cent of the whole lump.

Social Costs and Benefits

SOME attention is devoted in the paper to the measurement of social costs and benefits and the need to separate carrying costs and track costs is emphasised. Unfortunately the social benefits, however real, tend to be imponderable. If one counted "the social benefit" of track and signalling improvements in railway modernisation which produced a saving of 10 minutes (valued at a shilling) on each of the thousand million passenger journeys a year, that would add £50 million to the return on the investment. If the rise in land values along the line when electrification takes place exceeds the capital cost of the electrification, is the revenue return then infinite? Such calculations are not entirely without value; they can be helpful so long as they are not misused. Alas, they often are. Other matters that must be taken into account in determining high policy include:

The social value of population dispersion and the degree to which the commuter problem is a result; distribution of industry; the extent to which the community is prepared to permit monopoly for perhaps short-term material advantages and the extent to which it is prepared to tolerate chaos and waste in order to preserve individual freedom; a balance of advantage between large- and small-scale units, between specialised and general-purpose instruments, and between diversity and standardisation; the possible line of technical developments in the further future; and questions of defence.

There is a heartfelt sentiment in the conclusion that, whatever the irrational or un-economic man thinks and says what he wants today, he will not fail to take a very different view if in due course (in circumstances anything like the present) the reasonably comprehensive and efficient services of public transport—on tap to all comers—have been allowed to die off.

Comparisons of Potentials

COUNTERING the claim that railways use up more manpower than other forms of transport, which overlooks the inclusion in the total of railway staff of men who build the vehicles, maintain track or signal the traffic, services which the road carrier does not provide for himself, the paper suggested that a locomotive-hauled eight-coach express train averaging 55 m.p.h. can produce 8,600 seat-miles per hour per man. A 10-car suburban electric might produce at only 25 m.p.h. 12,000 seat-miles per hour per man; town and country buses owing to their differences in average speed may vary from 600 to 1,100, while a private car with four seats, assuming speeds of 30 to 45 m.p.h., produces 120 to 180 units in this calculation. Turning to the man-year and dealing in millions of average seat-miles per year per man of crew, we get a figure of 4.5 for the locomotive-hauled express, 10 for the electric multiple-unit train, 1.75 for a diesel multiple unit, down to 1.1 for a London bus (excluding conductor). On similar lines a seat-miles per gallon comparison ranges from 420 for a diesel-hauled express to 620 for a long-distance coach or a country bus, and a mere 120 for the private car. This comparison holds good if cost is equated to seat-years of life, but in freight comparisons the capacity-ton per year of life units for railway wagons and locomotives at £7 to £11 are much cheaper than a 16-ton vehicle on the road at £24 or a 5-ton diesel truck at £32. The longer life of the rail vehicle tends to favour it in comparison except for the obsolescence factor. Sir Reginald discussed factors of cost and social choice and made a renewed approach to track costs with an indication of lines which deserve further study and research. The true economics of the road-rail question lie, as he said, beneath the surface, and are complicated enough to justify real humility in any approach. The present social urge is away from the cheapest pattern of transport, and towards the private car and the C-licence. We must also calculate the social benefits of preserving a proper measure of public transport, only assessable if we imagine public transport has disappeared. Efficient and economical transport may be likened to salvation; we are all in favour of it but few are yet ready to accept the discipline and ideas which alone will ensure it. Nevertheless, we believe this paper may well mark a new start to a proper and impartial consideration from the national viewpoint of the road-rail question. The evaluation of policy is more a matter of art than science, but the policy may as well be based on a scientific foundation.

The new Glasgow suburban electric trains at a Glasgow rolling-stock display in connection with the Scottish Industries Exhibition and also announced a new ship for the Stranraer—Larne service with a capacity of 1,400 passengers and 79 cars. The previous day intercity diesel trains had begun between Glasgow, Ayr and Girvan and diesel locomotive haulage of certain Edinburgh—Aberdeen trains.

The Farnborough display of the Society of British Aircraft Constructors opened on September 7 when it was visited by technicians from the aircraft industry. Thereafter some 8,000 guests of the S.B.A.C. from all parts of the world have been studying the latest British products in military and civil aviation. See pages 3 and 4.

Trans World Airlines is to commence a twice-weekly all-freight service from London to New York on October 6.

The Ministry of Supply is backing the further development of the Fairey Rotodyne VTOL aircraft. It has also ordered a military version of the Armstrong Whitworth Argosy.

THE FARNBOROUGH SHOW



THE cry at recent Farnborough shows has tended to be that there is little that is new and it was to be heard again this year, but it is certainly unjustified at least so far as civil aircraft are concerned and the many products associated with them and their operation. This is the twentieth flying display and exhibition staged by the Society of British Aircraft Constructors and the twelfth to be held at the Royal Aircraft Establishment. In past years the weather has been mixed, and the first day has often been full of doubts as to whether the full flying programme could be carried out or not. This year there was no such uncertainty, and by 9 a.m. the morning mist was rolling away and being replaced by the sunshine which has been almost commonplace this summer.

As already indicated, there were new transport aircraft to be seen, and throughout the morning long queues awaited their turn to walk through aircraft interiors. This is not, of course, possible with the SRN1 Hovercraft, but that unusual transport vehicle has been the centre of much interest, while its progress up and down the runway—unladen the first time and carrying 20 fully equipped Royal Marine Commandos the second—has been watched almost with bated breath. Early in the flying display comes the de Havilland Comet 4B with its shortened wings and lengthened fuselage decked out in the new colour scheme of British European Airways. Two other aircraft appearing at Farnborough for the first time—the Vickers Vanguard and Handley Page Dart Herald—also wear the B.E.A. colours, and we must say that the more we looked at them the less suitable we thought them. The black gives a most funeral appearance which is made little or no lighter by the red squares looking like postage stamps stuck on in various places. The Comet behaves, as always,

with exactness and the reverse thrust on the outboard Rolls-Royce Avons is used on landing. The engine manufacturer has previously been to the fore with the Conway Vulcan which precedes the Comet.

Accent on Transport

The Bristol 192 twin rotor helicopter with two Napier Gazelle free turbine engines looks, of course, somewhat like the 173 which figured at Farnborough for several years, but it emits a rather different sound and this year shows some aspects of the military role for which it is in production by depositing a party of fully armed soldiers and then lifting a Bloodhound missile. The accent of the whole display can, indeed, be said to be on transport for the Fairey Rotodyne and Westland helicopters later in the programme carry loads, and part of the Royal Air Force display coming between the Comet and the 192 is a fly-past by Transport Command which includes Scottish Aviation Pioneers and a Twin Pioneer, a Bristol Sycamore and a Westland Whirlwind helicopter, a Blackburn Beverley, Handley Page Hastings, de Havilland Comet 2, and, the latest addition, a Bristol Britannia. The newest version of the Twin Pioneer with the higher powered Alvis Leonides engines is claimed to require a ground run of only 140 yd. for take-off and 200 yd. for landing, but these are pessimistic estimates on its showing in the display.

Part of the Westland helicopter display with, from the top, the Gnome-powered Whirlwind lifting an Austin Moke, a Gazelle-powered Wessex with a Land-Rover, and a twin-Eland Westminster hoisting (out of sight) a 103-ft. bridge; the latest version of the Scottish Aviation Twin Pioneer; the Armstrong Whitworth Argosy freight aircraft with four Rolls-Royce Darts, and, right, the Fairey Rotodyne seen over the nose of the Vickers Vanguard

have been announced by the Ministry of Supply within the past few days. It takes off after a very reasonable run for an aircraft with a gross weight of 82,000 lb. and appears to handle very precisely.

Rapid Proving

The Vickers Vanguard is, as already indicated, in B.E.A. colours. It is the third production aircraft, and although the first machine only flew on January 20, the three have so far accumulated some 380 hr. towards the 1,500 required for the full certification programme. This is most encouraging with a new aircraft which may, as the commentator says when it is flying, stem from the Viscount but nonetheless embodies many different constructional features. This aircraft is due to leave next month for tropical trials at Khartoum and Johannesburg. There is not really a great deal to be said about its performance in the display. It is certainly very quiet for a machine with four engines of over 5,000 s.h.p. and it turns in a stately yet handy fashion to show its lines to the crowds below.

Another aircraft concerning which there were official pronouncements on the eve of Farnborough

British products in the smaller sizes which could create difficulties if the market were suddenly to develop for private and executive aircraft. Among the piston engines still in production are the Alvis Leonides and Leonides Major radial units, but the former this year appears in its new higher-powered 530 version wherein the piston stroke has been lengthened from 4.41 to 4.8 in. The helicopter version—554/1—is also shown as a Leonides Major, also for that type of aircraft. Blackburn Engines, Limited, makes a particular feature of its A129 free turbine unit which develops almost 1,000 s.h.p. Several have been built and it is expected to come into full production in the near future. The smaller Turmo 600 free turbine is also exhibited and the Palouse gas turbine in a variety of applications including a starter truck based on the Commer 15-cwt. chassis. The airborne auxiliary power unit is fitted in the Victor 2 and also in the Canadair CL44 transport.

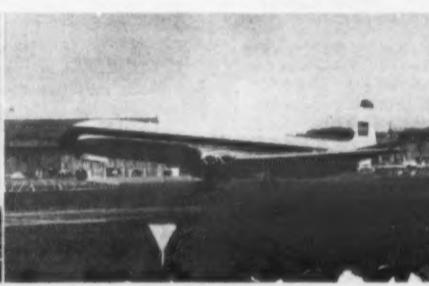
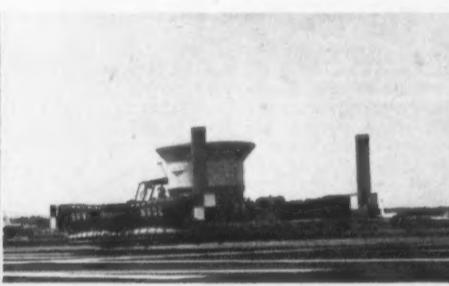
Bristol Siddeley Engines shows a number of engines which has been applied to military purposes and also the Proteus 765 turboprop which is now being fitted to Britannias and is claimed to have the low specific fuel consumption of 0.486 lb./e.h.p./hr. cruising at 325 knots at 25,000 ft. The BE58 makes

propeller for the Armstrong-Whitworth Argosy and also a sectional propeller hub assembly for the Viscount.

As already mentioned there has been an increase of 50 per cent in the space allotted to the outdoor equipment display and a number of exhibitors have stands in the exhibition hall and also outside. Applications of Pop and Imex rivets are shown by Aircraft Materials together with harness fittings for supply dropping and other purposes, while the Airscrew Co. and Jicwood, Limited, has a wide range of fans for a variety of purposes in civil and military aircraft and also a scale model of the fan supplied for the Saunders-Roe Hovercraft. Air Trainers Link, Limited, has a model of the flight simulator for the Comet 4B which is being provided for British European Airways and shows also the training aid for the Bendix flight system fitted in the B.O.A.C. 707s. As usual the Automotive Products and Lockheed Precision Products stands are adjacent. They carry Purolator filters, self-sealing couplings and hydraulic equipment among which is a new electrically-signalled selector valve.

Extruded sections in both aluminium and magnesium alloys and aluminium alloy sheet pretreated with various types of protective covering are shown by Birmetals, Limited, and the British Aluminium Co., Limited, has a particularly interesting feature in the light of the growing interest in freight aircraft in the shape of P-G-P non-slip treadplates for freighter floors. It is also, of course, highly suitable for gangways and the like. Aircraft equipment interests of British Thomson-Houston are now incorporated in the motor and control gear division of Associated Electrical Industries and the main features of its stand are a complete aircraft electrical generating system and an isopropyl nitrate turbo-starter equipment. The former has a diagrammatic layout to show the principal components of a variable speed a.c.-d.c. power scheme similar to that installed in the Comet 4. Leather for upholstery and panelling and other aircraft furnishing and also for the furnishing and decoration of aircraft buildings is shown by Connolly Bros. (Carriers), Limited, and Decca Radar has on the radar display site its HF200 height-finding equipment, which is one of the largest radars ever taken to Farnborough. Also on show is a 3-cm. wind-finding radar designed specifically for meteorologists. Inside the exhibition hall Decca Navigator displays the new Mark 10 receiver to the A.R.I.N.C. specification, together with the Mark 8 and lightweight Mark 9 receivers produced to the same requirements.

As already indicated the extent of the Dowty Group exhibits has been swollen this year by the British Messier and Rotol contributions. Apart from propellers and associated components, there is a new dual input actuator for aircraft flying controls governed by both mechanical and electronic input signals. Two American products manufactured under licence are the Dowty Moog valve and the Rotol hydro-mechanical constant speed drive. The Dowty spill burner has now been developed to suit two-spool engines. New Dunlop exhibits include a fan-cooled aircraft wheel brake which reduces the cooling time by up to four-fifths. There is also a range of collapsible rubberised fabric containers designed to enable any aircraft to be used as a tanker without modifying the freight compartment. Electro-Hydraulics, Limited, with



The Bristol 192 twin-rotor military helicopter; the SRN1 Hovercraft, and, right, the de Havilland Comet 4B in the new B.E.A. colours

is the Fairey Rotodyne, it being stated that the Ministry of Supply was supporting the further development of this VTOL machine with a view to military orders for the larger production version which will have Rolls-Royce Tyne turboprops. At this year's display the aircraft is fitted with seats and foreshadows one military role by carrying a party of 30 nurses. It is apparent when it takes off that there is still some way to go before its noise level is considered acceptable for operation into city centres. The last participants in the flying programme, other than the display by the Royal Navy, are helicopters by Westland Aircraft, Limited, and the now-associated Saunders-Roe, Limited. Whether it is possible to evolve a suitable noun of assembly such as, perhaps, a hovering, we do not know but it would be very appropriate for two Westminsters, a Wessex, two Whirlwinds, a Widgeon, a P531 and a Skeeter. It may, moreover, be noted that save for one Whirlwind, the Widgeon and the Skeeter all are powered by gas turbines. Initially the Westminster, which now has two Napier Eland E229A engines delivering 3,150 s.h.p., has been developed as a flying crane and one of those at Farnborough carries a 103-ft. bridge developed by the Military Engineering Experimental Establishment under the guidance of Sir Donald Bailey. As a passenger carrier the aircraft could accommodate 40. The Wessex, which has a

its debut. It is a ducted fan engine with civil and military applications and it is claimed that, apart from a remarkable thrust-weight ratio, the noise level is from 10 to 15 decibels lower than that of conventional turbojets of similar power. A reminder that it is still interested in piston engines is given by de Havilland Engine Co., Limited, on the stand where it shows a turbocharged Gipsy Major 215 for the Saunders-Roe Skeeter, but particular interest attaches to the first Farnborough appearance of a turboprop version of the Gnome engine. Adapted from the basic Gnome turboshaft engine, the P1000 develops 1,000 s.h.p. but weighs only 555 lb. and has a specific consumption of 0.69 lb./s.h.p./hr. The P1200, an uprated version, is to be installed in the new Breguet 941 four-engined transport aircraft.

Since the last Farnborough show D. Napier and Son, Limited, has pushed ahead with the development of the Eland turboprop engine as a conversion power plant for the Convair 340 and 440 and also for the Canadian production line of the 540 and one exhibit is a power pack ready for installation. The Eland has also, of course, been developed in its helicopter form and is applied to the Westland Westminster. The Gazelle free turbine, which is also shown, powers the Bristol 192 twin rotor helicopter and the Westland Wessex. As a type name the Avon is a show veteran but the RA29 in

aircraft furnishing and also for the furnishing and decoration of aircraft buildings is shown by Connolly Bros. (Carriers), Limited, and Decca Radar has on the radar display site its HF200 height-finding equipment, which is one of the largest radars ever taken to Farnborough. Also on show is a 3-cm. wind-finding radar designed specifically for meteorologists. Inside the exhibition hall Decca Navigator displays the new Mark 10 receiver to the A.R.I.N.C. specification, together with the Mark 8 and lightweight Mark 9 receivers produced to the same requirements.

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Front views of the Vickers Vanguard, the Handley Page Dart Herald, the Vickers Viscount 816 in T.A.A. colours, and part of a freight load for the Armstrong Whitworth Argosy

The demonstration is by no means new but still seems somewhat uncanny. The Canadian-built de Havilland Beaver with Alvis Leonides Major engine also demonstrates its capabilities in restricted areas.

The Handley Page Dart Herald with its two RDa 7 engines will go into service next year with British European Airways, which is to operate three on loan from the Ministry of Supply for a period of five years on certain of its Scottish services. It is expected that it will receive its certificate of airworthiness next March and meanwhile it will make further demonstration tours abroad. It is intended for use from restricted aerodromes and in the display it takes a short take-off run and climbs rapidly. Immediately following the Herald in the flying programme is the Armstrong Whitworth Argosy which also has Rolls-Royce Dart turboprop engines, but four instead of two. With its high wing and swing doors at both nose and tail the aircraft has been designed specifically as a freighter, and, indeed, the floor height of 4 ft. was selected with the average height of road freight vehicles particularly in mind. Provisional orders placed include one from Riddle Airlines, the large U.S. scheduled freight operator for four and orders for a military version

Gazelle free turbine, lifts an Army Land-Rover equipped with an anti-tank gun, while a Whirlwind with a de Havilland Gnome free turbine hoists an Austin Moke, weighing with slings, 1,200 lb. The other Whirlwind, with an Alvis Leonides Major, carries eight soldiers and the Widgeon the R.E. bridging party of four.

In the static aircraft park there is a reminder that the Vickers Viscount is still a force in the land with a V816 of the type used by Trans-Australia Airlines. A second Armstrong Whitworth Argosy appears with a typical freight load—that in the flying display is equipped with passenger seats—and the de Havilland Heron is an eight-seat executive version. The Dove is one of the veterans of S.B.A.C. displays. This year the model is a Series 6 for six passengers. Napier anti-icing treatment is featured on a Lincoln—we little thought that one of those would turn up again—and Hunting Aircraft has a President on view.

Engines

As the years pass the proportion of engine exhibits represented by power units for jet aircraft and for missiles continues to rise and there is, indeed, nowadays something of a shortage of

the form shown by Rolls-Royce has a maximum sea level rating of 10,500 lb. and is one removed from a B.O.A.C. Comet after 1,500 hr. Newer basic units are the Conway by-pass engine, which can be said to have led a now rapidly growing fashion and is already in production for installation in Boeing 707-420 and Douglas DC8 aircraft, and the Tyne turboprop unit which is installed in the Vickers Vanguard and is also to power the Canadair CL44 and the Short Britannia.

As with piston engines so, to some extent, with propellers and those to be seen are, in any case, for turboprop power plants. The de Havilland examples include a 16-ft. diameter four-bladed type for the Canadair CL44 incorporating the Beta control, a new type of ground-control system in which blade angle in the low pitch and reverse range is controlled directly by the pilot, thus providing rapid and sensitive thrust response under all ground manoeuvre conditions. The constant speed propeller for the Gnome is 11 ft. in diameter and has three aluminium alloy blades. Three standard control systems are envisaged for application to this propeller. The Dowty Group has expanded in the past twelve months by acquiring Rotol and British Messier and the group stand includes a

Victor undercarriage retracted in a rig illustrates the compactness of such units for modern heavy aircraft. The components are machined from 115-ton high-tensile steel. Four wholly-owned subsidiaries of the English Steel Corporation combine to provide a display stressing the long association of the corporation with the aircraft industry and featuring drop-forged components, tools, permanent magnets, and finished components made from E.S.C. special aircraft steels.

A new tyre for the Boeing 707 with a high-speed tread in a straight ribbed pattern is among the exhibits of the Firestone Tyre and Rubber Co., Limited. Celebrating its twenty-fifth anniversary this year Firth-Vickers Stainless Steels, Limited, has among the examples of bars, sheets, centri-spinnings and static and precision castings, one of its newest steels—FV520—which combines the heat-resisting qualities of stainless steel with something of the light weight of aluminium alloys. In a joint display with Steel, Peep and Tozer, Limited, Samuel Fox includes a propeller bearing with forged steel rings, a jet-engine combustion chamber and a variety of rolled steel rings used in gas turbines. Occupying three adjoining stands (Continued on page 4)

The Farnborough Show

(Continued from page 3)

the General Electric Co., Limited, is showing a wide range of aircraft equipment, airport lighting, airborne electronic units, and instruments and also a model showing how Multiplex equipment is used to control a new R.A.F. airfield arrester barrier. The aircraft equipment includes, for the first time, an air-circulation oven with three-heat control for the S.A.S. Caravels, DC7s and DC8s. Fabric-reinforced tread tyres for high-speed aircraft appear on the Goodyear stand for the first time and Graviner this year stresses the wide range of its services to the aircraft industry and particularly in the consultative sphere.

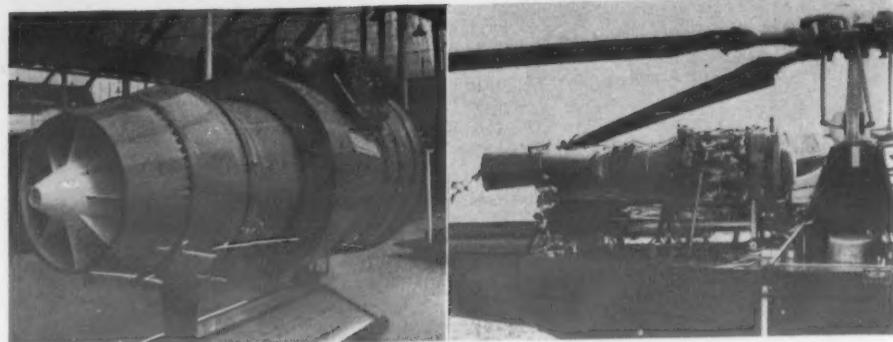
From the air transport viewpoint both the Handley Page and Hawker Siddeley stands have considerable interest. The former naturally concentrates on its fifty years of aircraft production and brings its record up to date with details of the Dart Herald and models of the HP113 executive transport incorporating laminair flow principles.

On the Hawker Siddeley stand there is a foretaste of the Avro 748, which may be expected to take part in next year's flying display, in the shape of a 26-ft.-long front fuselage section. It may be recalled that the aircraft will be powered

Lewin Road Sweepers, Limited, a company in the Brockhouse organisation, has a sweeper-collector designed for gang operation and its Sweepmaster sprinkler-sweeper-collector which can also be used as the tractor unit. Both are particularly suitable for work on airport runways and the like. Another group to occupy a number of adjoining stands is Marconi's Wireless Telegraph Co., Limited, and its associates. A special display of the AD2300B Doppler Navigator enables visitors themselves to fly two legs of a track. The Canadian Marconi CMA620 Doppler is also shown while the outside display includes a new demonstration unit of Marconi Instruments employing an articulated Bedford with Coventry Steel Caravans body.

Microcell shows two new seats. The Executive De luxe twin unit has a cabinet and tray between the seats and the Traveller No. 2 is intended for tourist and economy class.

The Ministry of Supply Blind Landing Experimental Unit and its work have already been described in MODERN TRANSPORT. This year a combined endeavour is being made to explain this system, the units of which are to be manufactured for possible civil markets by the three companies

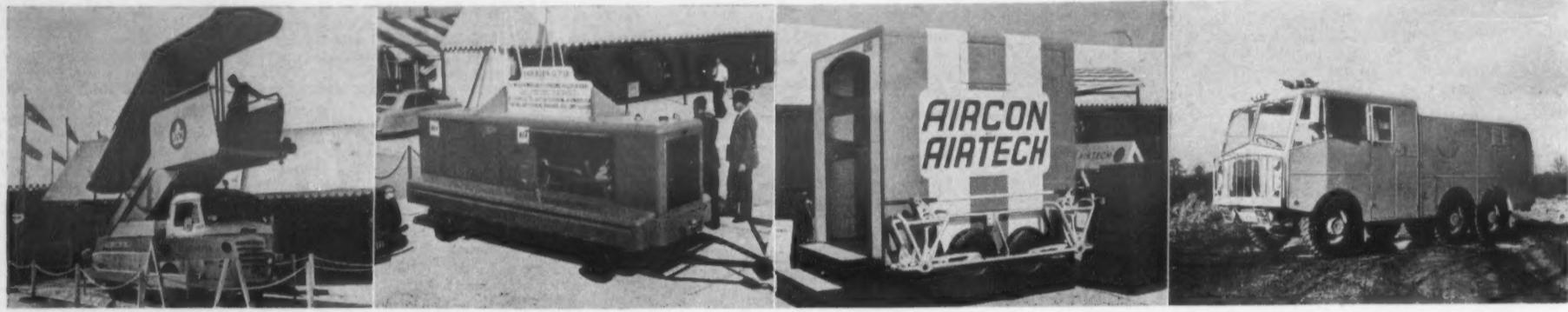


With both military and civil applications the Bristol Siddeley BE58 ducted fan jet engine appears in the exhibition hall; right, the Blackburn free turbine installed in the Saunders-Roe P531 helicopter

Canadian Government based on the Thornycroft Nubian 6 by 6 chassis with Rolls-Royce B81 engine. The vehicle has an independent front-wheel drive and also a Thornycroft auxiliary drive which makes it possible for foam or water to be pumped while the vehicle is in motion. This obviates the interruption of discharge during a change in the vehicle's position. Now in full production the Redifon SSB/ISB range of h.f. communications

is the DUS general-purpose v.h.f. ground transmitter. Super Oil Seals and Gaskets, Limited, shows five types of Aeroquip flexible hose with detachable reversible end fittings, a considerable variety of SuPerfect oil seals and Redcaps polythene protective caps and plugs.

This year Westinghouse Brake and Signal Co., Limited, confines its exhibits to a stand in the main hall. On it it manages to display a consider-



The new Edghill covered aircraft steps for Trans-Canada Air Lines on a Karrier; the Houchin d.c. ground servicing unit with Dorman power unit for B.E.A.; an ingenious container with retractable wheel trolley and, right, a Thornycroft Nubian six-by-six crash tender with Pyrene equipment for the Canadian Government

by two Rolls-Royce Darts will be shown in the colours of Skyways. Two new I.C.I. alloys—titanium 230 and 679—are shown for the first time on the stand of the metals division, together with two additional grades of commercially pure titanium. The paints division provides details of a chemical-resistant finishing scheme for aircraft skins and the plastics division shows the new Propathene polypropylene, a material very suitable for moulding.

On the Latex Upholstery stand are examples of the Lonsdale Flyweight seat produced by Aircraft Furnishing, Limited, in its three-passenger version with both fixed and reclining backs. A triple seat weighs 48 lb. and a double seat 36 lb. It may be added that the Avro 748 fuselage and the Fairey Rotodyne are also equipped with this type which was designed particularly for aircraft with high-density seating. In the outdoor equipment section

which collaborated with the Ministry. On the Ministry stand there is a short colour film and static display of the equipment involved. Murphy Radio shows a complete leader cable system, including the aircraft and ground units which provide the azimuth guidance. Smiths Aviation Division shows pictorially phases of automatic landing and the SEP2 autopilot gyro unit, while Standard Telephones and Cables has on its stand the radio altimeter used in the system. Centre piece of the Napier Spraymat stand is a special detachable leading edge section demonstrating the suitability of Spraymat for the ice protection of high-speed aircraft.

The Pyrene Co., Limited, has, as usual, examples of its wide range of fire detection and extinguishing system on its stand in the main exhibition hall. The outdoor equipment shown includes one of a substantial number of airfield crash tenders for the

transmitters is the principal feature of the stand, while Shell-Mex and B.P., Limited, shows a model of the new 10,000-gal. fueller—see page 5.

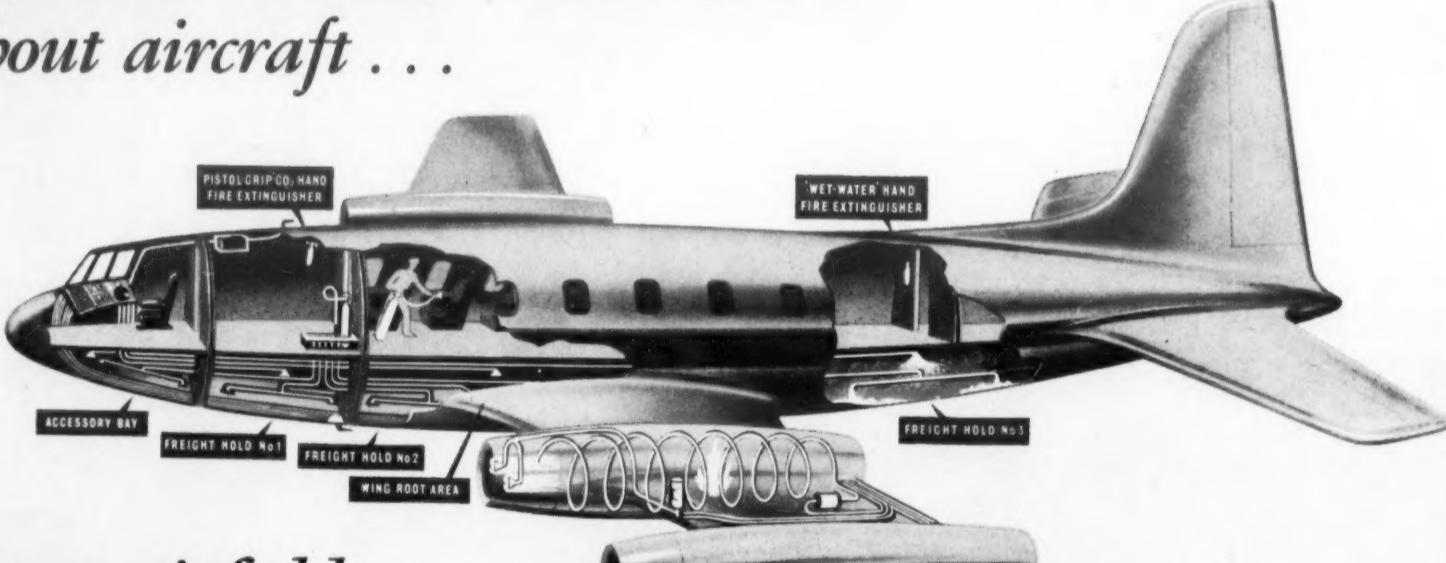
Central feature of the stand of Smiths Aviation Division is a pictorial display of Autoland, the automatic landing system developed by B.L.E.U. As mentioned earlier it embodies a Smiths automatic pilot similar to the SEP2 and the Smiths Flight System. Apropos the last, the Type 4 Flight System appears at Farnborough for the first time as do the A.R.B.-approved civil altimeters. Another of the participants in the Autoland development is Standard Telephones and Cables, Limited, which shows the radio altimeter produced therefor and capable of measuring the height of an aircraft down to 2 ft. A panoramic display describes the new STAN 7-8-9 high accuracy ILS equipment and there is a new presentation system for the range of automatic direction finders. Another newcomer

able range of semi-conductor switching devices. These include Tristors, controllable silicon rectifiers, germanium dynistor switches and high-power silicon transistors. New ground-to-air radio control equipment—the PTC3600—is exhibited by Pye, Limited. It is high-power (1 kW) v.h.f. transmitter which extends markedly the range at which aircraft can be in contact with ground control. Tests have shown that reliable two-way communication is available 450 miles out over the Atlantic and ranges of up to 1,000 miles have been experienced. H. W. Edghill and Co. Limited, usually produces something of unusual interest in outdoor equipment and this year it is a vehicle-mounted set of aircraft steps for Trans-Canada Air Lines complete with roof. Also in the outdoor equipment section Airtech shows the ingenious Aircon Type B container designed for the Britannia 253 and equipped with retractable trailer wheels.

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Be sure to call at stand No. 83 and Outside Equipment Exhibit "P" when you visit Farnborough.



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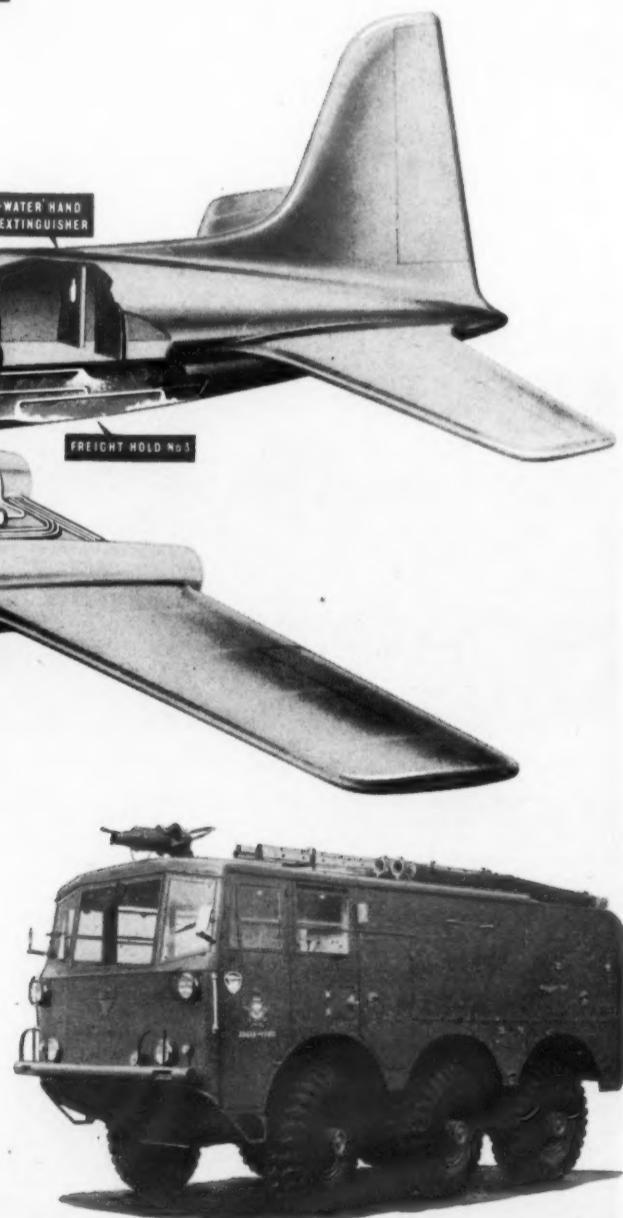
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The "Pyrene" Mark VI Crash Tender built on an Avis chassis with Rolls Royce engine will be on operational duty throughout the display

MODERN TRANSPORT
SEPTEMBER 12, 1959

5

10,000-GALLON FUELLER

Yorkshire Class for Air BP

USE AT OVERSEAS AIRPORTS

FUEL demands of the large jet aircraft now entering civil service in increasing numbers have brought a requirement for much larger fuelling vehicles and rates of fuelling if short turn-round times are to be preserved. The alternative use of hydrants at fixed points offers a satisfactory solution at some airports, but at many the mobile fueller will remain the most economical and flexible means of providing the necessary high-speed service.

Formal Handing Over

For this reason Air BP has introduced its Yorkshire class of airport fueller—a 10,000-imp. gal. articulated vehicle with a delivery rate of 750 g.p.m., a number of which are expected to enter service early next year at Continental airports. The first machine, comprising basically an A.E.C. Mammoth Major three-axle tractor and Saunders-Roe aluminium-alloy bogie semi-trailer tank, was formally handed over by Sir William Black, chairman, A.E.C., Limited, to Mr. C. Rees Jenkins,

capacity of 10,000 imp. gal. The trailer bogie and the fifth-wheel coupling have both been produced by Cranes (Dereham), Limited, to Saunders-Roe requirements. The special coupling is interesting in that the main cargo-pump pressure pipe is taken through its centre, a seal being achieved between the parts having relative movement by means of a Goodyear air-suspension-type convoluted bellows of oil-resistant rubber. A special Emco valve seals off the orifice when required.

The main cargo pump—a Pegson self-priming centrifugal unit—is driven from the full-torque main-engine power take-off, while a hydraulic pump, which powers the grouped all-hydraulic controls, is driven from the gearbox side power take-off. Metering equipment is by Avery-Hardoll, pressure-control equipment by Zwicky and fine-particle filters by Rellumit. The entire pumping and control system is mounted in pack form on the tractor. It has a total pumping capacity through two hoses of 750 g.p.m. and a defuelling capacity of 150 g.p.m. The largest long-range jet aircraft,



Air BP's new Yorkshire 10,000-gal. self-supporting aluminium fueller by Saunders-Roe hauled by A.E.C. Mammoth Major tractor, here posed with a de Havilland Comet 4B for B.E.A., a number of which, with cargo tanks and equipment by various manufacturers, will shortly be in service at Continental airports

director of various British Petroleum overseas associated companies, at the A.E.C. Southall works last week.

The Mammoth Major tractor is powered by the A.E.C. 11.3-litre diesel engine incorporating a C.A.V. all-speed governor set to produce 165 b.h.p. at 2,000 r.p.m. A spark arrester is fitted in the exhaust system. The tractor has a rather longer than normal wheelbase of 18 ft. 9½ in. in order to accommodate the pumping and control equipment and the two power-operated hoses in a compartment behind the cab. A fully articulated bogie, power-assisted steering and full-torque and low-power gearbox power take-offs are included in the tractor unit.

The semi-trailer portions and pumping and control equipment of two initial vehicles have been developed to a general British Petroleum Company specification by Thompson Bros. (Bilston), Limited, and Saunders-Roe (Anglesey), Limited. It was the Saunders-Roe machine that was handed over last week. It has a frameless semi-trailer tank of welded aluminium-alloy plate having a useful

such as the Boeing 707 and DC8, with a total fuel capacity of 18,000 to 20,000 gallons, could therefore be completely refuelled by two Yorkshire fuellers in about 15 minutes.

For Road Operation

The vehicle is about 51 ft. long overall, 7 ft. 10½ in. wide and 10 ft. 6 in. high, thus coming within the requirements for road operation in the countries where it will be stationed. The form of tank construction adopted eliminates the need for external paneling and saves substantial tare weight; the tank, which has bottom surfaces sloped towards central sample draw-off points, in fact presents a clean exterior rendered most attractive by its paintwork in Air BP colours.

The complete vehicle has the quite remarkably low unladen weight of 19 tons 2 cwt. A full load of 10,000 gal. of aviation jet fuel brings the gross weight to 54 tons 4 cwt., distributed 6 tons 8 cwt. over the front axle, 22 tons over the tractor bogie and 25 tons 16 cwt. over the semi-trailer bogie.

Low-Height Single-Deck Buses

ON A.E.C. REGENT CHASSIS FOR SOUTH WALES

THE problem of replacement buses for services on routes in the Machynus district, near Llanelli, which are crossed by bridges so low that they are impassable to modern single-deckers

6 ft. 2 in. in an overall unladen height of only 8 ft. 10 in. The vehicles have a forward entrance with driver-controlled power-operated door, with a special bulkhead arrangement to allow the driver a



A.E.C. Regent V double-deck chassis form the basis for two special low-height single-deckers (8 ft. 10 in. unladen) by the Roe factory of P.R.V. Group Body Sales for the South Wales Transport Co., Limited

of normal height, has been solved by the South Wales Transport Co., Limited, by the use of single-deck bodies on normal vertical-engined double-deck chassis. Two new vehicles have now been put into service based on A.E.C. Regent V chassis with bodies provided by the P.R.V. Group Body Sales Division from the Roe factory in Leeds.

With full-size single-deck buses all now of the underfloor-engine type, the choice of a double-deck chassis was dictated by frame height. On the Regent, a 37-seat body gives interior headroom of

clear view of the entrance. Construction otherwise follows conventional practice for vertical-engined single-deckers.

A fire recently took place in the office section of Atkinson Vehicles, Limited, at Preston. A considerable quantity of records was damaged, but production of normal vehicles will remain unaffected. A certain number of the special classes of vehicle under development may be delayed, but only for a short period.

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It is on the "Nubian" 6x6 chassis that the Pyrene Company are building their Mark 6T Crash Tender shown here, which is one of a large contract received from the Department of Transport (Civil Aviation) Canada. A unique feature of the chassis is a THORNYCROFT designed and built auxiliary drive to enable foam or water to be pumped while the vehicle is in motion.

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R.12

TRANSPORT ECONOMICS

1—Cost and Social Choice

By Sir REGINALD WILSON, M.Inst.T., Member,
British Transport Commission*

SOCIETY is made up of individuals. It is the individual who matters, or groups of individuals, and the current pattern of the individual demand for transport is not developing along the pattern of social cost. The private car multiplies exceedingly, and is the dominant feature of our age; there is a steady rise in the number of private freight vehicles. By contrast the fleets of public hauliers and of the railways are virtually unchanged; the regular public bus tends even to decline in numbers.

Why is there this divergence between social cost and society's choice? One answer is the ancient equipment and outmoded ideas from which railways suffered for so long. But the same explanation can hardly be true of the regular bus services, which have kept well abreast of the times, or of the business of public hauliers. The reasons for the divergence can perhaps be summarised as follows:

- (a) the social cost per unit of carrying capacity provided is not the same as the cost in money to the individual provider; "track," taxation, and other factors are involved;
- (b) the money cost to the individual provider per unit of capacity is not the same as the cost to the provider per unit sold, since the latter is affected by what goes unsold (as little as 10 per cent and as much as 80 per cent) and other such factors which are often the result of social policy—licensing, growth of peak problems, etc.;
- (c) the provider's cost per unit sold is not necessarily the same as the provider's charge to the user; a valid costing of services in detail is usually impossible, and in any case the provider recovers his total costs in accordance with various considerations (including the prices fixed by public regulation or public pressures) which often have only a marginal connection with his cost in detail;
- (d) the provider's charge for public transport (or a user's charge to himself for his own transport) is not necessarily the same as the value the user puts on a given facility.

Which of these items provides the biggest part of the explanation of the divergence will depend on circumstances.

Need for Distinction

We should, however, make a mental distinction between the first three items and the last. The first three are mainly concerned with things done by society (e.g. taxation, track charges, licensing, the tendency to peak, public regulation and so forth) and the effect of these doings is normally to increase the cost of the output which is actually sold—passenger-miles in place of seat-miles, and ton-miles in place of capacity-ton-miles. If taken far enough this process can bring the charge for an economical service to a point where it is no longer far below the charge for an uneconomical service, thereby removing or weakening the incentive of the individual to choose the cheaper means of transport.

When, in addition, only the marginal costs of the expensive transport are taken into account—by the private car owner, for example—and the said transport can be charged for tax purposes, the blurring of choice, so far as cost is a factor, is complete. What is done by society, however, can presumably be undone by society, or countered by it in some way. A very different matter is the last item, which is concerned with the distinction between benefits and costs. What are these benefits?

The Private Car

The private car is perhaps the best example of the truth that the individual will often attach more importance to what a service offers than to what it costs. The average man, if he can afford it, looks for convenience, speed, comfort and safety—something in that order—though of course fashion, a sense of power and well-being, selling pressures and many other factors are also at work. Attempts have sometimes been made to put figure values on one or two of these items, notably on the saving of time from increased speed and convenience. It is conceivable, of course, that the greater values from society's viewpoint are to be found in the opportunities for education and personal freedom which sometimes accompany greater mobility, but these are even more imponderable than the saving of time.

Time, we are told, is money. And so, in many cases, it may be. We are also told that the country will save great sums in travelling time when people can move faster on the roads. But surely, on the same argument, the country would save even more (and cost itself nothing) by inducing people to use a still faster medium—the railway—where it is available? To speed up movement by car may save waste, especially on a rural road, but may not be economic on arterial routes where a fast railway service provides speeds which are not likely to be beaten in normal conditions.

However, as private individuals we are not completely rational or "economic" men—and I would not have it otherwise. The man who puts a high value on independence, a door-to-door journey, and escape from the tyranny of the timetable, is entitled to the facility he wants provided he can afford it and does not discommode too many of his fellows in the process. There is no need to work up elaborate calculations suggesting that the private car is economic. We want it, and we want increased speeds out of it, and that is that—subject to public policy.

Problems of Public Policy

Two main problems of public policy are involved. The first is the undermining of the regular passenger services and the threatened loss of the social benefits which we derive from them. And though a change in tax rules, a more flexible basis of railway fares and other such measures might help to slow down the drift to the private car, the fact remains that this drift is in the main a natural and unstoppable phenomenon of our age. Unstoppable, that is, were it not for the second problem.

The second great problem of public policy is, of course, connected with track. I refer to the severe congestion of road traffic which now exists at critical points and times, and to the doubling of the number of vehicles which is promised. Will this not lead to a slowing down of movement—and

a costly one from the viewpoint of social cost—to set against the individual benefits achieved?

Private Road Haulage

The case for the privately-owned C-licence road vehicle rests on more economic grounds, however difficult they are to quantify. Control of transit throughout, integration with manufacturing processes, contact with customers, fear of strikes in the public services, publicity value—all these and other factors are at work. But the great rise of C-licence operation has also been helped in considerable measure by the artificial regulation of railway freight charges, and to some extent this legacy from the past is still with us. Old habits of thought die hard.

Many a customer is slow to accept the realities of the fact that the arrangements between himself and the railways are now to be settled by free negotiation—which, for example, implies that the railways need not carry for him unless they want to, or even that in certain circumstances they may require some sort of service contract. After all, many other forms of service (e.g. telephones, electricity supply, etc.) think it proper to ask for reasonable constancy on the part of the customer if they are to maintain the heavy investment involved. However that may be, if railways are to be competitive they must be free to compete; this freedom has not yet worked itself through the whole field of railway charging.

Is Do-it-yourself Cheaper?

Yet the public haulier has this freedom, but makes little headway against the rise of the C-licence. Why is this? Perhaps because, quite apart from the imponderable considerations mentioned above, the "do it yourself" principle may be cheaper. Sometimes, of course, it only looks cheaper. We fail to count up the full cost against ourselves, either because we would rather not (like the owner of the private car) or because we cannot, the costs being joint with others both in money and in terms of our business policy. Again, we may be "selecting" in our own favour and against the professional. The man who buys his own vehicles to employ in the hardcore of his traffics, keeping them busy 100 per cent and throwing the fluctuating margins upon a public transport undertaking, road or rail, must not be upset if in the long run that undertaking raises its prices against him. So that on balance he gains nothing.

In yet other cases the do-it-yourself principle may in fact be cheaper to a particular business without being socially economic. If every business insisted on keeping its regular work to itself, the charge for the remainder would have to be high indeed. But this would not prove that the social cost of do-it-yourself is inherently less than the social cost of public and professional working. It might mean, merely, that a constant and arbitrary selecting or discriminating against the professional carriers has prevented them from working on the most efficient basis. No monopoly is quite so tight as the monopoly which a private vehicle possesses of its owner. Once he has it, he has it. This is particularly true of the owner of the private car, but even the business concern must find it easier to start a C-licence fleet than to give it up. And if the fleet exists, the owner would not be human if he did not "select." Self suppliers in any line of business do much the same thing, but the effects on a service are much more serious.

Status of Ancillary Users

Where, then, do these C-licence fleets really stand in any social accounting? There is no certain or general answer. We know that on average the C vehicles tend to be less intensively used, both in miles per week and in load per vehicle of each class. On the other hand the private vehicle is engaged, often enough, in different types of work, with shorter hauls on average, intermediate loading and unloading and waiting, and so forth. Common sense will probably decide that whereas C vehicles tend to be less well loaded, save in special cases where the traffic is two-way, they have compensating advantages to the owner, to his customers, and often to society also.

In any case, a great part of C-licence work consists of local delivery work, the essential motor having taken the place of the essential horse. It is only the big vehicles engaged on long-distance runs on arterial routes which raise the same two issues of major policy: (a) is there enough "track" space to make society indifferent to light loading (with or without compensating benefits), and (b) how short-sighted are we if we fail to ensure the survival of the great public services, standing by and always available to all comers, many of whom are unable to create their own private fleets? There can be intelligent conjecture about the needs of policy, but little in the way of precise measuring.

Tramp Services

The age-old struggle between the liner and the tramp, so familiar in shipping circles and now developing in the air, has its counterpart in surface transport. Again, all one can do is to ask what is the value to the community of having regular public services, and where and in what circumstances and at what cost; and having received an answer—which will not be an answer for all time—to influence the outcome of things as necessary and appropriate. Some sort of purposeful action by the community will usually be necessary. Otherwise the tramp will make a good living by selecting just where he will compete with the regular services (rail or road) without carrying any of the disabilities and burdens imposed on the regular services for the public good.

An example of irregular or tramp operation in surface transport is the private-hire coach. I choose this example because the tramping may be done by the very concern which runs the stage-carriage services—partly in self-defence, no doubt, but partly because there is a genuine place for this kind of service. The self-same coach and driver can either do private-hire work, which gives less mileage but charges for the full vehicle, or engage in ordinary stage-carriage work, where they will be lucky to obtain a 50 per cent load on average. In the one case the passengers accommodate themselves to the bus, in the other the

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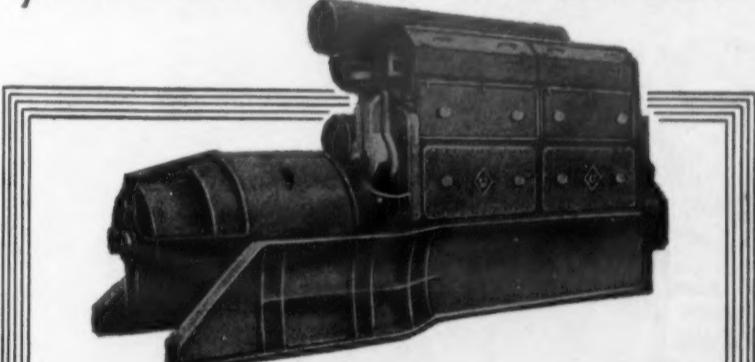


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* Abstract of Sections IV and V of a paper presented to the British Association for the Advancement of Science.

(Continued on page 8)

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A GENERAL MANAGER will be required at the end of December next by the above Companies which have joint offices and headquarters staff at Exeter and operate approximately 1,000 public service vehicles in Devon and Cornwall.

Applicants should have had extensive experience in passenger road transport operations.

There is a contributory pension scheme.

Applications setting out full particulars of age, present position, experience and indicating salary expected to be submitted before September 24, 1959, marked "Private and Confidential," and addressed to the Chairman, Tilling Group Management Board, 10 Fleet Street, London, E.C.4.

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1. Name and address.
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3. Whether single or married and, in the latter case, the number and ages of any children.
4. Education.
5. Training.
6. Professional or technical qualifications.
7. Full details of career and experience.
8. Present salary.

Cost and Choice in Transport

(Continued from page 7)

bus accommodates itself to the passengers. There is a world of difference, which properly reflects itself in the fare. How absurd are all discussions based on average fares!

But the tramp, passenger or freight, provides services of a flexible and bespoke character which have their own special value to the community, and both road and rail make a profit out of their excursion traffic. The rail will try to ensure that this does not undermine its regular services; on the road, however, it is a question of licensing. In either case, a question of judgment, but hardy a judgment based on irrefutable scientific processes of assessment.

Regular Public Services

In regular public services, road and rail, the cost of providing stand-by capacity is often the greatest single multiplier in the final costs which arouse so much adverse comment—especially when compared unthinkingly with the tramp charges. The commuter services of British Railways are an outstanding example. The cost per seat is reasonably economic, whether socially or in money, but the cost per passenger may be four or five times greater, because on the average over the 24 hours there are three or four seats empty and unpaid for in relation to every one that is sold, though during brief moments of the "peak" the capacity is more than 100 per cent sold! In regular passenger services as a whole it is rarely possible, in fact, to achieve a load factor in excess of 50 per cent either in train working or in bus working. London Transport buses manage to fill about 19 seats out of 56 on average; the big bus groups in the provinces, which work rural services also, achieve little better but are often able to employ a smaller vehicle.

And so we double our costs, and more, to provide regular services hour by hour, day by day, year in and year out—and whether there is a vast rush of traffic to meet or only a trickle. Is it worth it? Why not scrap this seemingly expensive arrangement? Indeed, a lot of people are tending, by the effect of their choices (short-term) to scrap it already.

Effect of Losing Public Transport

But when it is finally gone, or at any rate is undermined, what then? Does each one of us proceed by car? A car for each adult and active

member of the population means at least six times as many as at present. How to accommodate these at critical times and places will be an insoluble problem. And the cost? About 70,000 million passenger-miles at an additional threepence per passenger-mile let us say—leaving congestion out of it altogether—means almost £1,000 million a year on to the total national expenditure. In any case we cannot all afford cars. Even if we could, the car will often be in one place when we are in another, unless like the snail we become permanently ensconced in a car-house! Or if we do not intend to go by car, but to use collective transport, how do we go about finding another 30 to 50 people to form a bus load, or 200 to form a train load, and then negotiate with the carrier when we have identified one? Presumably we advertise, or we wait for the carrier to advertise a particular trip projected.

On excursions this is often done today, of course. To find a lot of people like-minded to go to the same place for the same purpose at the same time is not too difficult when football matches or other such outings are in question. But to go from

A further abstract from Sir Reginald Wilson's paper will outline views on track costs

Littlehampton to Liverpool on Tuesday morning the 15th to visit one's aunt, and to assure the said aunt that one will arrive about 6 p.m. is a very different matter, unless there is a regular public service available to a timetable published long in advance. The same applies to the innumerable business appointments which have to be made. A moment's thought should suffice to show that life would be far more costly, and even impossible, without regular services which are publicly obliged to run at certain times and at published fares. Taking road and rail together, the regular services account for at least half the total traffics, even including the private car, and for a vastly higher proportion of the critical traffics on the main routes and in the great conurbations—especially the commuter traffics, which would hardly get through at all otherwise. The social value of public services in such cases is almost too great to be reckoned.

Now is the position all that different in respect to freight. But it is only when the public service is no longer on tap, and the stand-by is gone, that the real rigours of the alternative will be apparent. The organisation of parcels services is, perhaps, a more easily comprehended necessity; in varying degrees the same need exists, however, throughout much of the world of freight. And so some sort of regulation is often inevitable, not for the sake of public operators but for the sake of the public itself in the long run—and given present circumstances.

Public Regulation

Without accepting the cynic's remark that the individual, left to himself, invariably consults his own good before the good of society, one is bound to admit that in transport the good of the individual (including groups and undertakings) is not always the same as the wider or longer-term good. And where the divergence of interest is serious enough, then social regulation, either fiscal or physical, or both, is likely to be required.

Let me make it abundantly clear that I am not hinting that C-licence operation should be physically restricted on principle, or that the private car should be discouraged. Not in the least. But we must remember that the more we want to move about, and the faster, the more space we need; or the more discipline; or both. Any system of discipline or regulation is virtually bound to have imperfections. For one thing, circumstances can change so quickly. But this is no argument against regulation as such, so long as on balance the existence of regulation has a clear social value to the community. The railways are under special forms of control, and I would have thought myself, today, that a licensing system of some kind, regulating services and fares, is unavoidable on the roads. And regulation will be extended more and more to the use of road space itself, no doubt, like charges for parking.

However, this brings us to the separate question of track, important not only because of its potential cost to the community in the years ahead, not only because it "distorts" the costs of the carriers and is a particular burden on some of the public carriers, but also because it presents us with a grave problem of logistics. Track is at once the most speculative element, the most elastic and the most arbitrary element of transport cost. At the same time, also, like public regulation it can be one of the main keys to social policy.

(To be continued)

NEW ALTERNATORS

By Crompton Parkinson

THE new PQ series of self-regulating alternators manufactured by Crompton Parkinson (Chelmsford), Limited, have a range of 70 kVA at 600 r.p.m. to 750 kVA at 1,500 r.p.m. 50 c.p.s. and are designed for single or two bearings with S.A.E. or other types of flange mounting. Magnicon exciters are fitted, which obviate the need for automatic voltage regulators. In the case of single-bearing alternators they are V-belt driven, but on two-bearing designs, could be arranged for direct flange mounting. Fabricated steel barrel construction with plate-type endshields is used on these machines.

The new PXA series alternators have similar construction characteristics but have conventional exciters for use with automatic voltage regulating equipment. The machines are manufactured in the range of 70 kVA at 600 r.p.m. to 1,500 kVA at 1,500 r.p.m. 50 c.p.s. Again provision is made for direct coupling to standard S.A.E. and other types of flanges. The AGT series is designed for coupling to gas turbine reduction gearboxes, the machines being of the single sleeve-bearing type. Filter ventilation is fitted which, with the use of Aerofoil cooling fans, ensures extremely efficient ventilation and quiet running. These machines are revolving-field salient-pole type in a range 750 to 3,000 kVA at 1,500 r.p.m.

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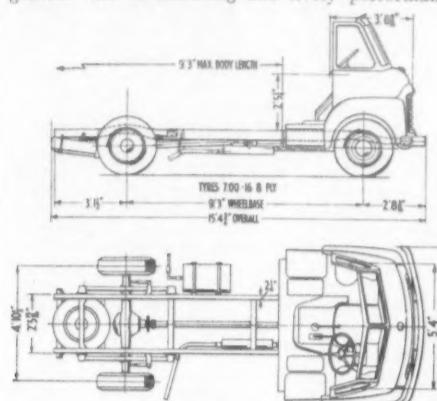
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COMMERCIAL VEHICLE TEST

Commer 1-ton Forward-Control Van*

MAXIMUM ECONOMY WITH DERATED LIGHT DIESEL

MANY attractive features of the recently introduced 1-ton capacity version of the Commer forward-control van should ensure for it a future as successful as the record of the larger 30-cwt. vehicle, from which it is derived. Among these features are a capacity of 280 cu. ft. in a convenient overall size, compact good looks, excellent operating economy both on the open road and in congested traffic conditions, quiet operation, general ease of handling and lively performance.



Drawing showing principal dimensions of the Commer 1-ton van

and availability in chassis-scuttle form suitable for the fitment of special bodywork.

The 1-ton van has a wheelbase and body length shortened by 1 ft. compared with the 30-cwt. version. The short wheelbase of 9 ft. 3 in. gives a wheeltrack turning circle of 40 ft. and takes a standard welded steel van body having load-space dimensions of 9 ft. 4 in. long, 5 ft. 6 in. wide and 5 ft. 6 in. high and a useful capacity of 280 cu. ft. Flush-fitting sliding side doors are rather narrower than on the large van but still provide an opening over 2 ft. wide, permitting access to the rear of the van clear of the driver's seat. The doors latch in the fully open position and are fitted with lock-

steering and hydraulic brakes, is generally as for the larger van, except that the standard axle ratio is 5:14 to 1—about half a ratio higher than the 30 cwt.

Comfortable and Quiet Ride

The test vehicle, which had covered just over 2,000 miles when we took it over, provided us with a comfortable and very quiet ride and we completed a good solid day's work, much of it in London suburban traffic, with a full load of 1 ton in hot and humid conditions without having found fault with the very light handling qualities or performance. Vision forward and to the quarters was excellent and while the windows in the rear doors could perhaps be larger for greater convenience of the short driver, the large exterior mirrors could be set to provide a comprehensive view behind. Sliding side doors are always a boon on vehicles used principally on delivery work and they provide an additional advantage when they latch in the open position to give excellent ventilation in hot weather.

A stout, conveniently positioned gear lever permitted fast changes through the synchromesh box, imparting a performance that more than matched the general rate of acceleration away from traffic checks. Measured with the stop watch on a suitable stretch of fairly level road, average times of four runs, two in each direction, to reach 20 and 30 m.p.h. respectively from rest were 9 and 17 sec., or 1½ sec. better in each case than we achieved in the 30 cwt. with fully rated engine. Top-gear acceleration was rather slower, requiring an average of 13 sec. to go from 10 to 20 m.p.h. and 27 sec. from 10 to 30 m.p.h., but was quite smooth.

Good Gradient Ability

There was no adverse effect of a rather high top gear in the various observed sections of our hilly route, the engine showing all the customary diesel pulling power once it was got up to about 1,000 r.p.m. After completing most of the long pull up Purley Way past Croydon Aerodrome in top gear, during which speed dropped to 20 m.p.h., a change into third gear brought immediate acceleration and the crest was breached at well over 30 m.p.h. The gradient of Succombs Hill proved no obstacle, an easy restart being made on the 1 in 4½ section.

TEST RESULTS AT A GLANCE

Vehicle Details

MAKER: Commer Cars, Limited, Luton, Beds.

TYPE: 1-ton forward-control diesel van.

ENGINE: Rootes Light Diesel, four-cylinder four-stroke with Ricardo Comet V combustion system; 3½ in. (84.14 mm.) bore, 4 in. (101.6 mm.) stroke, 137.9 cu. in. (2.28 litres) displacement; 48½ b.h.p. at 3,000 r.p.m., 89½ lb./ft. (12.37 kg./m.) torque at 1,500 r.p.m.

TRANSMISSION: Clutch, Borg and Beck 10 in. (254 mm.) dia. single dryplate; gearbox, four-speed synchromesh with power take-off facing ratios 5.7704, 3.0289, 1.7025 and 1 to 1 forward, 6.9852 to 1 reverse; Hardy Spicer open tubular shaft with needle roller bearing joints; rear axle, spiral bevel with fully floating half shafts, ratio 5:14 to 1.

BRAKES: Girling hydraulics providing 20½ sq. in. (1,306 sq. cm.) total lining area.

TYRES: 7.00-16 8-ply rating, single all round.

WHEELBASE: 9 ft. 3 in. (2.819 m.).

WEIGHT: Complete vehicle ready for operation 1 ton 18½ cwt. (1,968 kg.).

PRICE: Chassis-scuttle £640. Van complete £843. (For petrol engine subtract £120.)

able handles, as are also the full-width rear doors, which are hinged to fold right back and clip against the body sides. A hardwood floor is treated with preservative before painting and is secured to longitudinal steel runners by steel clamping plates, which also serve as anti-wear strips.

Equipment

Normal equipment includes an adjustable driver's seat, sliding windows in the side doors, two windscreen wipers and driving mirrors, semaphore-type indicators, interior roof light, full lamp and rear reflector set, rubber floor mats in driving compartment and quilted engine cowling cover (with diesel engine). A passenger seat is available at extra cost. The complete diesel-engined van in standard trim has a licensing weight of 1 ton 16½ cwt., which gives adequate allowance for fuel,



In a test the Commer turned inside a swept circle of 43 ft. diameter; right, connecting up a fresh cartridge in the braking-distance measuring magazine



equipment, a crew of two and a full 1-ton payload within the recommended gross weight of 3 tons 2 cwt.

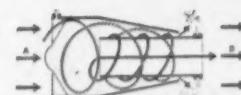
As with the 30-cwt. van, alternative chrome-bore petrol or the Rootes light diesel engines are available in the 1-ton vehicle. The standard diesel engine is a derated version of the 2.26-litre four-cylinder four-stroke unit, set to produce 48½ b.h.p. at 3,000 r.p.m. and a torque of 89½ lb./ft. at 1,500 r.p.m., which provides maximum economy without sacrifice of performance at the lower gross weight. The engine employs the Ricardo Comet V combustion system and the C.A.V. DPA distributor-type fuel-injection pump. The fully rated engine, which has a net output of 50 b.h.p. at 3,000 r.p.m. and maximum torque of 97½ lb./ft., is available optionally. The specification otherwise, which includes four-speed synchromesh gearbox, fully floating spiral bevel rear axle, cam and peg

get well warmed up. A hard application at the foot of the hill after speed had been allowed to run up to 30 m.p.h. locked all the wheels and produced a reading on the Don meter of 87 per cent—roundly what had been obtained on a good matt surface with cold brakes.

Light Responsive Brakes

The brakes generally had a light responsive action and pulled the vehicle up squarely, except when the nearside wheels were in roadside grit. Six measured emergency stops were made on various types of level surface using the chalk-firing magazine to mark the point of brake application. Average stopping distance was 45 ft. (with a best distance of 44 ft.), equivalent to an overall retardation rate of 21.5 ft. per sec. per sec. or 0.67 g. The handbrake, mechanically linked to the rear wheels, held the loaded vehicle easily on a 1 in 4½ gradient and produced Don meter readings of 38 to 40 per

(Continued on page 12)

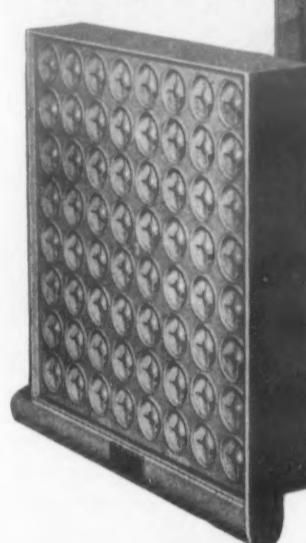


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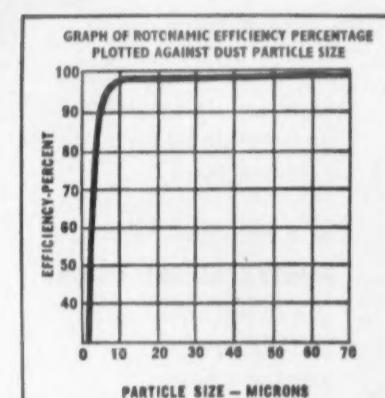
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NEWS FROM ALL QUARTERS**Start on Slough—Maidenhead By-pass**

On September 3 work started on the construction of the Slough—Maidenhead by-pass. This road will be 2½ miles long, will entail construction of three major and two minor bridges, and have two 24-ft. carriageways. The contract is held by Higgs and Hill, Limited, whose civil engineering division is carrying out the work on behalf of Buckinghamshire County Council. The road should be completed by 1961.

**Model Railway Show**

The Model Railway Hobby Show will be held this year at Central Hall, Westminster, on September 23-26 (admission 2s. 6d.). Twenty leading model equipment manufacturers or suppliers will exhibit, together with eight clubs and societies and there will be three large working layouts. The chief display piece will be specimens of all the models of diesel locomotives and railcars now available in this country, organised by Mr. W. F. Bolton, service manager of the diesel train division of British United Traction, Limited.

**Railway Winter Timetable**

Owing to the recent printing dispute, winter railway timetables which normally appear at this time of the year cannot be produced until later and because of this enforced delay the start of the winter services has had to be postponed from September 14 until November 2. The summer timetable will, however, be modified and details of the altered services are, it is stated, available at all British Railways stations, inquiry offices and ticket agencies. A supplement to the existing timetable listing all cancellations and alterations is available. In the Eastern Region, local Sunday services between Ipswich and Yarmouth and elsewhere will be withdrawn.

**Tyne Tunnel Changes Approved**

New proposals by the County Councils of Durham and Northumberland for the construction of a road tunnel between Jarrow and Howdon under the Tyne have now been approved by the Minister of Transport. The tunnel and its approaches will connect the Gateshead-Sunderland road (A184) and the Newcastle-Tynemouth road (A1058) and there will also be access to the tunnel approach roads in the neighbourhood of Bewicke Street, Wallsend, and Dee Street, Jarrow. The tunnel was previously authorised by Parliament in the Tyne Tunnel Acts of 1946 and 1956, but, as a result of further consideration being given to the scheme, new plans have been prepared which will enable the tunnel to be driven through the bed-rock underneath the river and will provide accommodation in the approaches for the toll booths. The County Councils are to promote a Bill in the next session of Parliament to authorise these changes. Work of construction could then start towards the end of 1960 and the tunnel and its approaches could be completed in some five or six years. The cost will be about £12½ million. Of this amount £3 million will be advanced by the Government in the form of a grant and about £6½ million as a loan, leaving the County Councils to contribute £1 million outright and to borrow the balance of about £2 million. The two loans will be repaid out of the revenue from tolls.

Italian Motorways

A sum of 40,000 million lire is to be allocated by the Italian Government to the building of two new motorways—from Palermo to Pescara via Catania, Bologna and Rimini and from Messina to Catania. In a new general road-building programme extending over some years Italy is to spend 240,000 million lire on the building of new roads and the rebuilding of existing ones.

**Munich Tram Subways**

Experts who have been studying the traffic situation in Munich have recommended that a tramway system almost 11 track-miles in total length should be laid underground. The cost of the project would be about £32,500,000. Also planned is a "city railway," intended to join the two main stations, Central and East, and to carry the suburban services of the German Federal Railway. Total cost of this scheme is estimated at £25 million.

**C.o.I.D. Record of Designers**

The Council of Industrial Design announces that as from January 1, 1960, it will make a charge for the services of its Record of Designers. Trading concerns in Great Britain making the necessary well-defined requests for short lists of designers will be charged three guineas for each inquiry dealt with. Where additional work is required a special fee will be quoted. In cases where constructive help cannot be given, a charge will not be made.

**Bristol Parking Meter Plans**

Bristol, which claims to be the first city outside London to complete a comprehensive parking plan, hopes within a year to get Ministry of Transport approval to put up parking meters and to charge for off-street parking. Some plans have already been approved for multi-storey car parks, which it hopes will all be privately developed. These should eventually provide places for 3,732 cars. It is also intended to provide free parking sites for motorcycles, bicycles and invalid-carriages. The draft plan for the entire scheme has been approved by the planning and public works committee but it still has to come before the finance committee and the city council.

**New Zealand Railways Accounts**

A policy of attracting business and holding expenditure by emphasis on improved efficiency in the day-to-day operations of the railways department has had satisfying results, according to the annual report of the New Zealand Government Railways for 1958-59. Freight carried was the second highest annual figure on record, and the number of passenger journeys the greatest since 1949. Total earnings from all branches of operations at £34,372,864 were only £69,905 less than in the preceding year, but working expenses (excluding interest charges) were reduced by £450,891 to £35,137,305. The working loss of £764,441—one-third less than in the previous year—was met from the department's general reserve which was now reduced to £2,240,000. It continued to be necessary to use part of the cash balances from other reserve funds, principally the depreciation reserve, to provide working capital.

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MODERN TRANSPORT
SEPTEMBER 12, 1959

11

COMMERCIAL AVIATION

Better Payload for Comets

NEW T.W.A. FREIGHT SERVICES

THE maximum loaded weight of the de Havilland Comet 4 and the Comet 4C jet air liners has been raised from 158,000 lb. to 162,000 lb. and this without any increase in tare weight. The effect of this increase in operating weight will be to improve the profitability of the Comet 4 and 4C when carrying big payloads on long stages. The range is extended by some 200 statute miles when carrying capacity payloads. For example, the Comet 4's maximum still-air stage, with first-class capacity payload (60 seats), and reserve fuel, goes up from 3,020 to 3,225 statute miles. The corresponding increase for the Comet 4C (with 72 first-class seats) is from 2,620 to 2,820 statute miles. The Comet 4 with, say, 79 tourist-class seats can fly stages as long as 3,380 statute miles if carrying something less than its capacity payload; but now new Comet 4s will be less payload-restricted. Their payload will be improved on any stages between 2,800 and 3,380 statute miles, and over much of this bracket the improvement will amount to 2,700 lb.—more than a ton. The Comet 4C shows to even better advantage. In the case of the 92-seat tourist-class arrangement extra payload can now be carried on stages of between 2,300 to 3,320 statute miles. As in the case of the Comet 4 the maximum additional payload is 2,700 lb.

Winter Car Ferry to Cherbourg

The first winter car ferry service to Cherbourg will start in late autumn, Silver City Airways announced recently. The new service will operate on a daily basis between Bournemouth and Cherbourg. Hurn Airport is more suitable for winter flying than Southampton (Eastleigh).

T.W.A. Seeks British Hostesses

Trans World Airlines is shortly to launch its biggest drive to recruit British girls for flight hostess jobs in the United States. Starting in October a selection board will tour Britain, visiting Edinburgh, Manchester and Birmingham in addition to spending a two-week period in London. It hopes to select at least 50 girls, and will take more if possible. T.W.A. already employs over 20 British hostesses.

T.W.A. Freight Service from London

Trans World Airlines will inaugurate a twice-weekly all-cargo service between London and New York on October 6. It will operate these new flights with Lockheed 1049H Super Constellations. These aircraft have a total carrying capacity of 27,000 lb. and will be fitted with special doors 8 ft. 10 in. wide and 6 ft. 2 in. high. The all-cargo services will operate on Tuesday and Thursday nights from London Airport.

Finance for Flying Tiger CL44s

Mr. Robert W. Prescott, president of The Flying Tiger Line, recently announced the successful completion of financing for a fleet of 10 CL44D4 turboprop freighters purchased from Canadair, Limited. Mr. Prescott said the airline had sold privately \$5 million 5½ per cent convertible debentures due in 1974. Proceeds of the new issue of debentures were applied to down payments on the new aircraft fleet, which was scheduled for delivery in the spring of 1961. The balance of the purchase price, approximately \$43 million, was covered by equipment trust certificates.

Air France Improves Techniques

Air France has recently installed a new electronic supervisory system in its London reservation department. The aim of the equipment is to improve the telephone technique of the reservation clerks. The installation in London follows the introduction of similar methods in Paris. The system enables the manager of the reservation department to listen in on any conversation between clerk and client and to record it. The recording can subsequently be played back to the clerk and the manager can then point out how he could have improved his handling of the call.

B.O.A.C. Fares for Emigrants

Special rates on North Atlantic routes of the British Overseas Airways Corporation during winter months will enable emigrants to fly from Britain to the U.S.A. or Canada for fares in the region of £60. From October 15 to June 30, 1960, B.O.A.C. is offering to bona fide emigrants one-way journeys to U.S. or Canadian ports of entry at fares 60 per cent of the normal tourist fare or 70 per cent of the normal economy fare. The concession also applies from points in Europe, with the exception of Greece and Italy. Instead of the usual free baggage allowance of 20 kg. (44 lb.), there will be a special allowance of 30 kg. (66 lb.) for emigrants.

B.E.A. to House Historic Aircraft

British European Airways has agreed to a suggestion by the Royal Aeronautical Society that, as some of the accommodation in the new extension to its engineering base will not be required until the Vanguards are delivered next summer, it should make available part of this space to accommodate the Society's Nash Collection of historic aeroplanes temporarily while a number of keen maintenance engineers—including some from B.E.A.—undertake renovation work in their spare time. It is intended that when the old aeroplanes have been reconditioned, they will provide a nucleus for a national aeronautical museum.

New Helicopter Airline

On Wednesday the directors of Rotorports, Limited, announced the formation of a new associate operating company, Inter-City Airways, Limited, which it is intended will operate scheduled helicopter services in the United Kingdom and between the United Kingdom and the Continent of Europe. Application has already been made to the Air Transport Advisory Council for the following scheduled helicopter services: London Airport—Central London—Southend Airport; Hendon Airport—Central London—Gatwick Airport; Central London—Portsmouth—Ryde—Cowes—Southampton; and Central London—Birmingham—Manchester. If Government permission is forthcoming for the development of Rotorports' proposed Central London Heliport at Nine Elms Lane, Battersea, it is anticipated that Inter-City Airways will be able to operate scheduled helicopter services from it within two to three years. Otherwise operations will have to await provision of a Central London heliport by Government or local authorities. Inter-City is considering suitable helicopter equipment. Of particular interest to the company is the developed version of the Fairey Rotodyne and the proposed civil version of the Bristol 192. The Vertol 107 in civil form is also under consideration.

FIRST OCCUPANT OF
A NEW POST

T.C.B. Miller

Mr. T. C. B. MILLER,
M.B.E., M.I.Mech.E., M.I.Loco.E.

• • • • •

As already recorded in MODERN TRANSPORT the mechanical and electrical engineering, carriage and wagon engineering, and road motor engineering departments of the Eastern and North Eastern Regions of British Railways have been divided and in the Eastern Region the three departments are being merged under a chief mechanical and electrical engineer with headquarters in London. Mr. Terence Charles Barry Miller, previously motive power officer in the office of the line traffic manager (Great Eastern), has been appointed to this new post. Educated at Fulneck Boy's School, he entered railway service in January, 1929, as a premium apprentice at Doncaster locomotive works, London and North Eastern Railway. Becoming a supernumerary foreman at Glasgow Queen Street in December, 1932, he held posts at Helensburgh and Glasgow before going to Burntisland in 1939 as assistant to the district locomotive superintendent. Transferred two years later to Edinburgh Haymarket as locomotive shed foreman, Mr. Miller moved south in 1942 to the wartime headquarters at Shenfield of the locomotive running superintendent (Eastern Section), Southern Area, L.N.E.R., where he became technical assistant. In October, 1943, he took up the position of assistant district locomotive superintendent, Ardsley, transferring to a similar appointment at Cambridge in the following March. The post of district locomotive superintendent, Stratford, which he took up in December, 1947—it was redesignated district motive power superintendent in November, 1948—involved close association with the entry into service of the Britannia Class 7 Pacific locomotives with the resulting recasting of East Anglian express train services. Mr. Miller's next appointments to the post of assistant motive power superintendent, Eastern Region, in November, 1955, and to that which he has now relinquished two years later—brought him closely in touch with the continuing modernisation of motive power. He was concerned with the introduction of railcars in the Leeds-Bradford area and later with the diesel-electric main-line locomotives. Diesel traction with the necessary maintenance depots became established on a steadily widening scale until now a large number of steam locomotives has been replaced, particularly on the Great Eastern line. Mr. Miller, who was awarded the M.B.E. in the New Year Honours of 1956, is a member of the Institutions of Mechanical Engineers and Locomotive Engineers.

LETTERS TO THE EDITOR

Rationalising Plymouth

BUS VENTILATION

SIR.—If the Plymouth—Saltash suburban service is eventually withdrawn (MODERN TRANSPORT, August 15), it will be (1) because North Road Station is not conveniently situated for local amenities and (2) because the rail service has not been extended farther afield where its superior speed would give it the advantage over the buses. The convenience of passengers would be served by providing a simple platform adjacent to the down Millbay line where the viaduct crosses Union Street right by the new city centre. Trains from Saltash would run direct to Union Street, reverse, and continue to North Road and beyond on a cross-city basis.

An escalator at Union Street would be desirable. This is not an expensive luxury. Department stores have them, and they are provided between subway and platforms at Liège, Belgium. At the Gare du Nord, Paris, an escalator from the Metro is controlled by a ray and stops when out of use by passengers.

Before the war the G.W.R. had started work on a new railway from St. Germans to Looe which was to be worked by diesel railcars from Plymouth. This would have permitted very pleasant residential development. Looe becoming to Plymouth what Southport is to Liverpool, with a nice green belt in between. The railway should enter the planning business and try to ensure building development adjacent to its outlying stations. Too often the new communities (e.g. Hemel Hempstead, Garston and Heswall) have been planned out of touch with what could have been convenient rail facilities.—Yours faithfully,

R. G. R. CALVERT.

45 Woodway,
Oxhey,
Herts.

Jersey Motor Transport

SIR.—Your readers may care to know that the J.M.T. petrol Leyland Titans of types TD1 and TD2 have come out of retirement for the last time this summer, to assist in carrying upwards of 45,000 passengers per day on the J.M.T. routes.

Following the supply of a further two new Leyland Titans with Reading bodywork, 27 ft. long and similar to the three supplied in 1958, plus the eight ex LTE RTL type Leylands in service, it was assumed that these old petrol-engined Leylands would be permanently displaced. Negotiations are in hand for the purchase of the TD2 highbridge bus by the veteran passenger vehicle preservation society. The single-deck fleet is rapidly being standardised on the Albion Victor chassis, though one Leyland LT2—also with petrol engine—is still in service, with one elderly Regal recently fitted with an oil engine. The town service is maintained by four Dennis buses seating 22, of which one is a prewar, petrol-engined Dennis Ace.—Yours faithfully,

GEORGE BEHREND.

The White House,
Rozel Harbour,
Jersey, C.I.

Bus Ventilation

SIR.—Ventilation in buses has been the subject of correspondence in the press recently and a paragraph appeared on page 4 of MODERN TRANSPORT of September 5. Looking back over the last 25 years or so it would seem that the number and size of opening windows has steadily decreased. At one time a large number of full-drop windows was provided on most buses and all coaches. Then came the half-drops which were gradually reduced in number and after the war the small sliding ventilator became standard with most operators. Very often only two per side are fitted and nothing at the front. Now there is produced what is surely the most inadequate ventilator of all—the so-called hopper. Furthermore, two each side are considered adequate to replace four sliders per side with the result that travel in the recent warm weather has been unbearable.

Operators seem to forget that in towns buses travel slowly along streets usually bounded by tall buildings and require much more ventilation than a vehicle moving quickly in open country and it should have been obvious to L.T.E. that the elimination of front-opening windows and reduction in size of the opening section of side windows would produce oppressively hot conditions in the summer months. Presumably it was another attempt at economy.

If the bus industry really wishes to regain its lost passengers it must provide comfortable conditions for all weathers and an adequate number of proper opening windows—as well as ventilators—should be provided. After all, in bad weather they can be closed and if necessary locked. Standardisation is all very well but the current practice of running identical vehicles on short town and long country routes is bad. A 10-min. journey on a slippery leather seat in a vehicle of austere finish and spartan comfort is bearable but it just will not do for a long country or interurban journey. Under present-day conditions I find bus travel so unpleasant that I only use a bus when there is no alternative.—Yours faithfully,

R. F. MORGAN.

201 New Barn Lane,
Prestbury,
Cheltenham, Glos.

The Editor is always glad to receive letters from readers on subjects germane to the transport industry, but these should be written as concisely as possible. The opinions expressed therein must not, however, be regarded as having editorial endorsement. Where correspondents desire to use a nom-de-plume it is essential that the Editor should be informed of the name and full address of the writer as indication of good faith.

A memorial service to Sir William Wood was held at St. Pancras Church on September 7 and was attended by Lady Wood and their son, Mr. J. V. Wood. Among others present were Sir Brian Robertson and members of the British Transport Commission, officers of the London Midland and other Regions and of the former London Midland and Scottish Railway, together with Sir Robert Burrows, last chairman of the latter company. The lesson was read by Sir John Benstead, deputy chairman, B.T.C. In his address the vicar, the Rev. John Borrill, referred to the long-standing connection between the church and British Railways at Euston.

COMMER 1-TON VAN TEST

(Continued from page 9)

cent when applied smartly at speeds of about 20 m.p.h.

The Commer 1-ton van is powered and geared to give adequate performance with maximum fuel economy. We measured fuel consumption in three separate tests. The first was over our standard 15-mile out-and-back route on A25, running through the villages of Westerham, Brasted, Sundridge, Bessels Green and into Riverhead for the turnround. This is a fairly confined and rather undulating route calculated to produce realistic results as opposed to freakish performance that might be possible on flat open main roads. The vehicle covered this route, not without some baulking by slower vehicles on two of the gradients, for a fuel consumption of 36.8 m.p.g. at an average speed of 28.8 m.p.h., indicating a probable ability



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to better 40 m.p.g. in more-open conditions when some part-laden or empty running is included.

A second check covered some six miles of an undulating section of A21, making four stops in each mile. At each fourth stop the engine was also stopped for half a minute and after each stop the vehicle was accelerated smartly up to about 30 m.p.h. In this test consumption worked out at 28.6 m.p.g. The final check was to top up the main tank after 152 miles had been covered since filling up at Luton before starting the test. The day's run had included about 30 miles in London suburban traffic and the many stops and much full-throttle low-gear work in our various acceleration, braking and hill-climbing tests. The Commer came through it outstandingly well with an average fuel consumption of 30.6 m.p.g.

INDUSTRIAL ACCIDENTS

Prevention Aided by
B.O.G. Survey

REGULAR surveys designed to prevent accidents in industry from the use of worn or obsolete equipment are being carried out on a nation-wide scale from the eight district headquarters of British Oxygen Gases, Limited. All oxy-fuel gas equipment in use in many major industrial undertakings as well as small factories and workshops throughout the country is examined and reports made on its condition and operating efficiency. The investigations are carried out free of charge.

Highly-trained technicians who carry out the survey, apart from investigating and reporting on equipment, are also able to advise on greater operating efficiency, with elimination of wastage and reduction in manufacturing costs. Some district headquarters work in close co-operation with industrial safety groups in their areas while lectures, films and demonstrations are arranged for the benefit of industrial safety officers, technical classes and similar institutions. Commenting on the service, the manager of one of the largest districts, Mr. D. W. Freemantle, said: "It is, of course, impossible to say how many likely accidents have been prevented by our surveys, but it is quite surprising how often we find worn and obsolete equipment."

Forthcoming Events

Until September 13.—Society of British Aircraft Constructors Flying display and exhibition. At Farnborough.

Until September 18.—Packaging Exhibition. At Olympia.

September 12.—Railway and Canal Historical Society. Visit to Leeds and Liverpool Canal.

September 13.—Omnibus Society. Visit to East Kent Road Car Co., Limited, Canterbury. 2 p.m.

Omnibus Society (Northern). Visit to United Automobile Services in Newcastle.

September 14.—Institute of Transport. Brancker Memorial Lecture by Captain E. V. Rickenbacker, "World Peace through Air Transportation." At 88 Portland Place, W.1. 5.45 p.m.

September 15.—Railway Correspondence and Travel Society (Birmingham). Paper by Mr. J. Clay, "Some Notable Speed Records and Test Runs." At Engineering Centre, New Street, Birmingham. 7.15 p.m.

September 16.—Railway Correspondence and Travel Society (West Riding). Paper by Mr. W. E. Waite, "The New Leeds City Station Project." At B.R. Social Club, Aire Street, Leeds. 1. 7.30 p.m.

September 17-26.—International Motor Exhibition. At Frankfurt.

September 18.—Light Railway Transport League. Paper by Mr. I. Smith, "The Swansea and Mumbles Electric Tramway." At Mechanics Institute, Bridge Street, Bradford. 7 p.m.

September 19.—Railway Correspondence and Travel Society. Notts and Derbyshire Rail Tour. Aviation Forum. Annual dinner. In Eagle Airways DC6C. Take off Blackbushe. 7 p.m.

Light Railway Transport League. Paper by Mr. J. S. Webb, "Tramways of the Black Country." At Exchange and Engineering Centre, New Street, Birmingham. 3 p.m.

September 21-25.—Municipal Passenger Transport Association. Annual conference. At Edinburgh.

September 22.—Institution of Locomotive Engineers. Presidential address by Mr. R. A. Smeddle. At Federation of British Industries, 21 Tothill Street, S.W.1. 5.30 p.m.

September 26-27.—Railway and Canal Historical Society. Weekend visit to Wakefield area and inaugural meeting of Yorkshire local group.

October 12.—Institute of Transport. Presidential address by Mr. R. G. Grout. At 88 Portland Place, W.1. 5.45 for 6.15 p.m.

October 12-16.—International Air Transport Association. Annual general meeting. In Tokyo.

October 26-28.—Road Haulage Association. Annual conference. At Bournemouth.

November 12.—Public Transport Association. Annual dinner. At Connaught Rooms, Great Queen Street, W.C.2. 6.45 for 7.15 p.m.

From January 1 to June 30, 1959, 39,827 tons of crude oil were produced from British Petroleum fields in the United Kingdom. Most of these fields are in the Nottingham area.



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INLAND FREIGHT

Future Trends

By G. F. FIENNES, M.Inst.T., Great Northern Line
Traffic Manager, Eastern Region, B.R.*

DEMAND for freight transport, like the habit of travel, is growing. Responsible estimates of the rate of growth are not very precise, but they agree fairly closely. The average expectation is that national production will increase by about 60 per cent in the next 10 or 15 years. Of that increase over one half will be translated into a demand for transport. Within that national average the demands of each industry vary widely. Coal, for instance—crystal-gazing here—will rise slightly with the expanding electrical industry, nuclear power and oil-firing notwithstanding. Oil will go up by over 80 per cent, steel by 60. Agriculture will remain much as it is.

The geographical demand for transport is unlikely to alter much. There are powerful opposing forces in a state of approximate balance. The social interest requires work to be brought to people rather than people to their work. When a basic industry in any area declines, the Government encourages other industries to move in. The object is a natural one, to diversify the work in each area and to spread the social risk. On the other hand the growth of the industries depending on import in bulk, the growth of the size of the unit in manufacture has stimulated development of the sea-board. On the whole this force has been contained. It has not and will not often—words carefully chosen—demand a radical alteration in the direction or form of transport.

Choice of Transport

Next, of what sort shall transport be? There is a distinction here between the national interest and the demand of the user. The national interest demands that transport shall be efficient in the service of the nation; streamlined, taut, spare, always down to its fighting weight; fighting for the best transits and lowest costs for our exports and our consumption at home. The broad principles are convenience, reliability, speed, safety and economy.

The demand of the user is for something else as well—naturally. A leading industrial expert in transport, a member of one of the great firms in this country, has written recently: "Each form of transport should be so developed and exploited that the sum total of the activities of all forms constitutes an efficient transport system produced at the lowest possible cost to the community. Co-ordination or integration is justified only if it results in greater efficiency and/or reduced overall costs than would otherwise be the case. It could not, in any case, be justified if there were no provision for a fair measure of competition." The italics are mine.

National Interest

The national interest is for transport broadly equated to the national need. The individual interest is for plenty of competition, which by its nature requires a surplus which cannot be stored. There is no frozen ton-mile. Transport by its own nature is the most perishable of things. True, the lorry, the wagon, or the craft like the tree grows until replaced. Like the fruit the service must be used as it is ready for use or it perishes. "No one is so careless of cost—other people's cost—as the user of transport."

Having this transport on tap the user may choose his form. He may also choose within limits whether he will operate that transport himself or employ privately-owned or nationally-owned concerns. His choice depends to a great extent on the relative emphasis which he attaches to the principles of convenience, reliability, speed, safety and economy. Many industries are already geared to supply at a few hours' notice: fruit, flowers, vegetables, fish, meat, newspapers, naturally come from the source of supply through, maybe, both wholesaler and retailer to consumer in that time. More and more industries producing and distributing consumer goods have come to recognise that by gearing themselves in the same way they reduce the stocks which they hold at their premises and in the pipeline between the producers and themselves. One very large concern by taking thought released last year in this way £21 million for other capital use. To these industries the emphasis is on reliability and speed.

At the other extreme are the basic industries of coal, oil, iron and steel, and agriculture other than market gardening. One of their principal interests is that their processes shall not be held up by a hiatus in the arrival of their raw materials or by congestion in the dispatch of their finished products. They demand reliability, but it means something very different from reliability in, say, the fish trade. Speed is less important; a steady flow more. Economy, since transport is a larger component of the final cost of the product, is vital. Between these extremes is an infinite range of shades of demand.

Relative Technical Advantages

The advantages of road transport are massive. For convenience a flexible small unit, available like the railway train at all hours of the day or night seven days in the week, but ready to move at any moment unhampered, as the train is hampered, by the organisation required to match the wagons with an engine, a crew, a brake van, and a path over the line. The unit is small; more closely matched to the unit of the country's trade than is the train of 500 tons. Lorry does not wait for lorry as wagon must wait for wagon. There are opportunities for individual service in the time of loading and unloading which the railway, and its trains to a timetable does not offer.

In regularity the advantage of the smaller unit direct from door-to-door under the personal control of its own driver, predominates over the railway's practice of transhipment from road to rail at the outward rail terminal, of combination with other wagons to form a train, once, twice, or three times on the journey and of transhipment from rail to road at the inward rail terminal—on rail all this controlled by remote control of a series of individuals, none of whom has a direct interest in the journey as a whole.

Speed

In speed an average of 20 m.p.h. allows overnight transits up to, say, 250 miles. There are few large centres of production or consumption in the country which are farther than that distance

apart. The speed of the lorry, which by no means matches that of the railway train, is firstly good enough and secondly is a true overall door-to-door speed, whereas the speed of the train is often of no account by reason of the delays inherent in the road-rail transfer and in marshalling yards.

In safety the personal supervision of the driver gives road an advantage. The door-to-door service with no transhipment to cause damage or loss, or shunting to cause damage. On the other side of the account is, firstly, the road accidents costing £175 million a year, and, secondly, the roughness of travel by road compared with rail. Some work on this subject done in Germany appeared in *Neue Verpackung* in June, 1958. It showed that the stresses of acceleration and deceleration on a road journey are as high as 6.0 g. transversely, 0.6 g. longitudinally and 3.0 g. vertically, compared with 0.2, 0 and 0.2 g. on rail. Even in shunting on rail stresses above 1.5 g. were most exceptional. These results are probably valid for this country, except for the stresses in shunting. In Britain it is common ground that road journeys cause less damage than rail and that such stresses are not significant. But rail journeys can be made less arduous than road.

Rail Advantages

This brings us to the advantage of rail. In convenience the service, nation-wide, ranks high. Next, the railway wagon will stand silently and comparatively cheaply awaiting the senders' or consignees' pleasure. The length of the queue matters less on rail than on road, whether viewed nationally or individually. Thirdly, most of the important industries are expensively geared to rail for inward and outward traffic with private sidings, mechanical loading and unloading. Some 95 per cent of railway tonnage is loaded and 74 per cent unloaded in private sidings. Much of the rest—domestic coal, for instance—is unloaded in railway yards where the merchants have space for storage.

In regularity the only point to be made for rail at the moment is that express freight trains on the move run reasonably punctually. There is a timetable which demands precision. In winter some 60 per cent are within 30 minutes of time; in summer some 80 per cent. The proportion of express freight to the whole is rather more than one-third. Traffic, therefore, which travels on express trains and neither needs to transfer from road to rail or is especially treated as it does so, nor passes through marshalling yards, has a reliable transit on rail. For the speed of movement rail is far superior. Fish and meat trains at average speeds of over 45 miles an hour and express freights at 35 and upwards have no parallel on road.

Advances in Prospect

Air transport development is likely to be along lines which will avoid the delays and dangers of transhipment at airports. This development can take the form either of the use of helicopters or other vertical take-off aircraft which will use the senders' and consignees' premises, or alternatively of conventional aircraft capable of absorbing vehicles or containers in its belly. Such transport by air will have much the same convenience, reliability and safety as the road unit. In speed it will be superior which will not matter very greatly since except over the longer distances road can, and rail will do everything which is necessary overnight. In cost it will be high. It will be used in two ways: the first to cream some highly profitable traffics, largely from road; secondly, and more sensibly, to carry over long distances traffics which are highly perishable.

Apart from road, rail and air, there are specialised forms of transport for certain products. Transmission lines for electricity and pipelines for gas and oil have special attractions.

Road Pros and Cons

For road transport there is a network of motorways planned along the principal arteries of the country—1,500 miles of them. There is a great programme of improvements to the existing trunk roads. The vehicle itself can develop little in capacity owing to the physical limitations of the track, especially of the bridges. It is unlikely to develop greatly in speed. There has been a significant reluctance on the part of the road industry to press on with the change from 20 m.p.h. to 30 recently permitted. There will be a marked trend towards articulation, separating the motive unit from the carrying.

On the other hand the forces moving against greater efficiency in road transport are considerable. The increase in the number of vehicles on the road may be more than seven million in the next 12 years. If the motorway speed movement through the country, the congested approaches to the terminals in the towns may offset that advantage. The increase in utilisation of the motive unit by articulation works for greater efficiency. Against efficiency works the increasing complexity and cost of the unit itself, the higher crew cost stemming from tighter organisation of union membership and—it is said softly—wider observance of the law. In short, opinion is that the efficiency of road transport will not surpass by much its present high level.

The Railway Revolution

The picture of the railways emerging from the age of the Stephensons is very different. Here the technical advances are revolutionary. The advances are under four principal heads: Traction; design of rolling stock; marshalling yards; and terminals. There are indeed other things—stronger track; better signalling; automatic warning control to suit the higher speeds—but they are not fundamental to the end product, which is a revolution in service.

Road-rail transfer is, in the author's view, the nub of the matter, the key to the railways' continued existence. Economically they cannot continue to exist on the bulk traffics alone. They must secure a higher share of the consumer goods which require transport, not siding-to-siding, but door-to-door. Railways have been shown to be faster and safer and sufficiently reliable when on the move. They throw away those advantages at terminals and in marshalling yards. There is no better way to cope with either difficulty than to avoid it.

Container and Amphibian

The design of a container is partly a problem in design to suit individual trades: to tip for some

(Continued on page 18)

Some new diesels

fitted with  WESTINGHOUSE

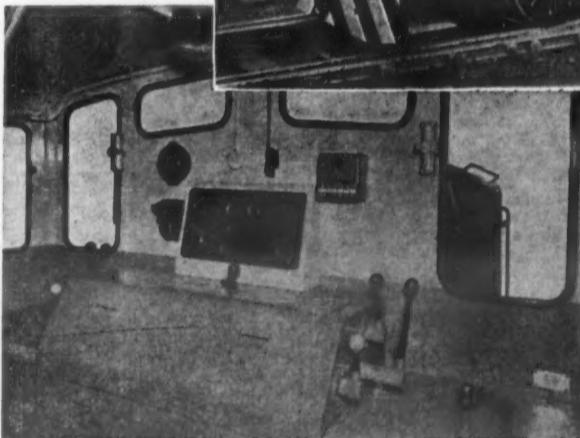
BRAKE EQUIPMENT



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MARINE NAVIGATION AIDS

Output of Stone-Chance Works

DEVELOPMENTS in marine and airfield lighting equipment were in evidence at the Crawley, Sussex, works of Stone-Chance, Limited, during a recent visit. This company, a member of the group known as Stone-Platt Industries, Limited, had its origin in Smethwick,



The 10 ft. 6 in. dia. lantern which will house the Dwarka lighthouse optic. The optic itself is seen in the background

when it was founded over one hundred years ago; the transfer of activities to Crawley New Town has been followed by intensified research into new designs and new materials for navigation signals and associated optical equipment, also extension into new spheres, e.g. electronic fog and cloud-height detectors. In addition there is an important business in automatic generating sets and Sumo submersible pumps, the latter finding a ready market in the U.S.A. for domestic water supply.

Largest for Many Years

Now nearing completion is the most powerful lighthouse optic constructed by Stone-Chance for many years and one of the most powerful in Asia, with an apparent intensity of 5.1 million candelas. The machine will rotate at 3 r.p.m., transmitting a double flash every 20 sec. visible in clear weather over a range of some 45 sea miles. In another respect this installation, which is destined for Dwarka, on the north-west coast of India, marks a turning-point; new research points the way to more compact installations, using the Xenon lamp which is capable of far superior performance to the normal filament type. Plastics lens also promise smaller installations with much higher light transmission values.

In the Dwarka lighthouse the illumination source is a 3,500-watt lamp (with a standby lamp which comes automatically into operation on a failure); the light is condensed into two beams set to provide

the two flashes every 20 sec. The whole apparatus is housed within a 10 ft. 6 in. diameter and the overall height of the lantern, its pedestal and finial, as seen in the accompanying illustration is 21 ft. 4 in.

The lantern is rotated by a clockwork mechanism actuated by falling weights, the weights being rewound every four hours by an electric motor. The lighthouse will normally receive its power supply from the land mains supply, but a standby generator consisting of a Lister 30-b.h.p. diesel engine coupled to a Crompton Parkinson alternator is provided.

Automatic Installations

At the present time Stone-Chance is supplying something like 40 per cent of the new or replacement lighthouse installations throughout the world. There are only two major competitors for this business, one French and one Swedish, but the competition is stiff. In this country, of course, the need for new lighthouses is unlikely to arise, although one was recently installed on the Scottish coast, but there are badly-lit seas in other areas, notably in the Caribbean, which has just been surveyed, and there are always replacements and modernisation schemes. The Ambrose lightship and Corregidor are recent examples of interesting installations and the 76-year-old Eddystone light, supplied by Stone, is shortly to be replaced. Modernisation is now in the direction of electrification and automatic operation, since everywhere it is found more difficult to recruit lighthouse keepers. Thus, despite the advance of electronic aids to navigation, there is no halt to the perfection of visual aids and indeed few ship's captains would wish to be deprived of them.

A fruitful outcome of research carried out in conjunction with the National Research Development Corporation and Trinity House (whose research department worked out the principles) is the fog detector unit, of which two models are available, one for open waters, the other for estuarial use. The basic principle employed is that of measuring the amount of light reflected from water particles suspended in the atmosphere. The apparatus is equally effective in conditions of mist, haze, fog, heavy rain or snow. It can be used to start a marine fog signal at visibility ranges of from a few hundred feet up to two or three miles, irrespective of whether the occurrence is close to or at some distance from the detector.

Fog Detection

In the FD1 version, ordered for many lighthouses, a telescope containing a photoelectric cell picks up the back scatter from clouds illuminated by a powerful searchlight flashing at wide intervals, amplifies it and feeds it to the control cabinet. A simplified version, the FD3, has been evolved to solve the problem of automatically indicating visibility on the turns in a river, where the degree of accuracy obtainable with the FD1 version is not called for. The prototype of this device was supplied to the Port of London Authority to form part of its new Thames navigation service introduced in May this year and referred to in our May 9 issue. It is installed in the new radar and radio-telephone centre at Gravesend.

Other devices on which development is being actively pursued are a cloud height detector for airfield or meteorological use and de-icing switches for aircraft and, reverting to the optics section, developments in plastics lens and the high transmission Xenon lamp, driven by a silicon transistorised motor unit, also a prototype silicon flasher unit.

Traffic in Copenhagen*

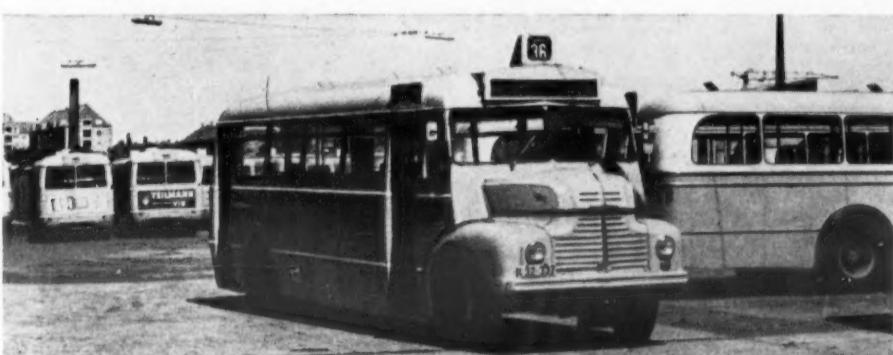
By EJNAR NIELSEN, Direktor, Københavns Sporveje

IN regard to future requirements for capital investment in the traffic of Greater Copenhagen an examination of the economic problems in connection with future traffic developments has been made in the course of the last two or three years on the initiative of the government's economic department. In this connection a prognosis has been made of the future extent of traffic, according to which the population of Greater Copenhagen in the course of 15-20 years must be supposed to grow to roundly 1.7 million, while the maximum traffic per hour through an imaginary ring round the central town area will probably increase from about 100,000 persons to approximately 150,000.

Future traffic will undoubtedly be a combination of public and individual transport, but in the working out of the future traffic apparatus one may think of different possibilities as to how great a share these two groups of communications will take of total traffic. Two alternative solutions have been advanced as working basis, one attaching the greatest importance to public transport and the other laying more stress on individual trans-

port. An examination of the economic problems in connection with future traffic developments has been made in the course of the last two or three years on the initiative of the government's economic department. In this connection a prognosis has been made of the future extent of traffic, according to which the population of Greater Copenhagen in the course of 15-20 years must be supposed to grow to roundly 1.7 million, while the maximum traffic per hour through an imaginary ring round the central town area will probably increase from about 100,000 persons to approximately 150,000.

Thus the difference between the investments required for the two alternative solutions is not great, but it must be added that in the solution attaching greatest importance to public transport the capacity of the urban railway system will exceed the anticipated maximum traffic per hour by at least 30 per cent, whereas roads and parking accommodation may be reckoned to be fully



A Leyland Comet bus in the fleet of Copenhagen Tramways

port. In the first instance extension is contemplated of the electric urban railway by several underground sections in Copenhagen proper and by a number of new sections in the suburbs; it is further envisaged that the network of streets will be extended, mainly in one level, with normal intersections controlled by traffic signals. As regards the alternative solution, where the stress is laid on individual transport it is not intended to construct actual underground railway sections, whereas it is contemplated to establish a number

utilised. Therefore, if future maximum traffic should exceed the above-mentioned figure of 150,000 persons per hour, the traffic apparatus based on the public transport solution would thus comprise a considerable "gratuitous" reserve.

In connection with these comments on future traffic it should finally be mentioned that the municipal authorities of the city of Copenhagen entertain schemes of displacing the main centre of the central business area westward to the present boundary of that area, near the Central Railway Station.

* Previous portions appeared June 6 and 13.

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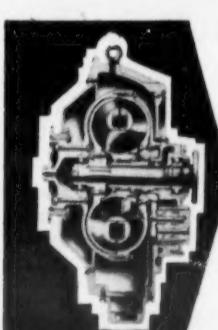
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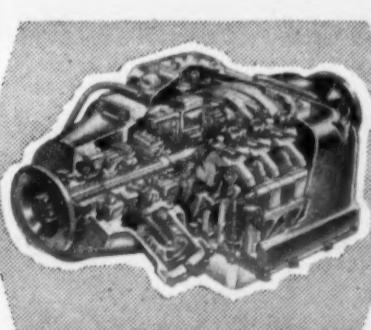
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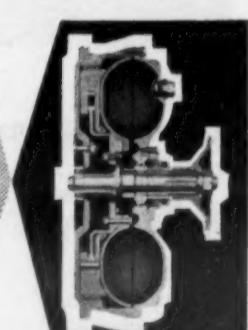
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LORRY—BUS—COACH

Performance of Motorway Coaches

PASSENGERS on high-speed Midland "Red" motorway coaches on the Birmingham—London route will experience no loss of the feeling of safety. Mr. D. M. Sinclair, general manager of the company, promised this after he had personally driven one of the newly modified B.M.M.O. 37-seat coaches at more than 80 m.p.h. around the test track of the Motor Industry Research Association near Nuneaton. "It was a very nice drive. We shall not need that speed on the motorway," he said. "They will be capable of up to 85 m.p.h., but are unlikely to travel much more than 70 m.p.h. They will average 50 m.p.h. In America coaches run at 70 m.p.h." As indicated in our last issue, 10 C5 coaches are having supercharged engines, overdrive gearboxes, high-ratio back axles, disc brakes and independent rubber suspension.

The journey from Digbeth, Birmingham, to Victoria Coach Station, London, is scheduled for 3 hr. 25 min. The return trip by coach will cost 21s. 3d., 15s. 9d. less than an ordinary second-class return by rail, but British Railways has day and half-day excursions which range from 17s. to 23s. 3d. return. The first daily services will be operated as soon as the motorway is opened next month, it is stated. The B.M.M.O. licence permits it to operate a maximum of 10 vehicles a day in

The demand for street space was increasing, and as speed slowed down, so must fares rise, because costs went up.

New Bus Stop Signs for Dublin

IMPROVED bus stop signs have been provided by Coras Iompair Eireann at a number of central city bus stops in Dublin. These signs indicate the places served by buses using the stop. The place names are in alphabetical order and the route numbers of the buses serving each point are shown. Hitherto bus route numbers only have been displayed.

No Grand Hotel for Drivers

AN appeal against the refusal by Northumberland County Council to grant planning permission for a hostel to accommodate 120 long-distance lorry drivers at Longbenton, near Newcastle upon Tyne, has been dismissed by the Minister of Housing and Local Government. The scheme included an adjoining thiefproof vehicle park and a fuel and service station. It had been submitted by Mr. J. W. Capstaff, managing director of J. W. Capstaff, Limited, and associated companies, with headquarters in Newcastle. At the public inquiry Mr. Capstaff had said that the project had been



One of 135 Metropolitan Vickers-Beyer Peacock electric locomotives for South African Railways en route from Stockton-on-Tees to Birkenhead. It is carried on its bogie centres by twin Crane trailers which have trunnion-ended springs to ensure even load distribution on undulating surfaces

each direction—four at 8.30 a.m. and 1.30 p.m., and two at 6.30 p.m. Later Midland "Red" hopes to introduce 45-ft. long 60-seat coaches and has already sought an M.O.T. dispensation for these. It hopes to attract most of its new customers from among private motorists. The company feels the speedy journey will appeal to motorists who wish to avoid the fatigue of driving themselves and the worry of finding parking spaces.

T.R.T.A. Survey Publication

PUBLICATION of the results of the T.R.T.A. survey on C-licensed vehicles was originally planned for August or September. The statistical data obtained have been subjected to over 12 months of detailed analysis. Publication was held up by the printing dispute and was then scheduled for early October. In view of the announcement this week of a General Election on October 8 it has been decided to postpone publication. This step has been taken, says the Association, to that the attention which the survey would normally attract should not suffer among election publicity. A new publication date will be arranged as soon as possible.

Tractor Fuel in Road Vehicles

USE of tractor fuel in coaches and lorries instead of diesel fuel oil led to two brothers being fined a total of £1,100 and ordered to pay £50 costs at Bakewell court on September 4. Defendants, John William Mycock and Dennis Mycock, of Rowson House, Monyash, pleaded not guilty to 12 charges. The prosecution said that in addition to the haulage and coach business the two men, with their mother, owned a farm on which there was a tractor. It was unlikely that one tractor could have used the quantities of tractor fuel that had been bought. The defence stated that the bulk purchases of diesel oil were not the whole amount used because very frequently vehicles had to be refuelled on journeys.

Motorway Project on Schedule

TOURING the 70 miles of the London—Yorkshire motorway now under construction, the Minister of Transport said this week that, barring unforeseen difficulties, the road should be able to accept traffic on the scheduled opening date, Monday, November 2. He drove the entire 70 miles, i.e. from Berrygrove, on the Watford By-pass near Aldenham, over the St. Albans section of the motorway, on to Slip End, south of Luton, where he had inaugurated work on March 24, 1958, and then the 53 miles of the London—Yorkshire motorway proper up to Dunchurch. He pledged himself to accelerate the pace of road development. Dual carriageways are to be constructed on the Barnet By-pass from a point near Apex Corner, Mill Hill, as far as the junction with the proposed South Mimms By-pass.

The Threat from Scooters

THE scooter is the biggest challenge to public transport, Mr. W. L. Russell, general manager of Dundee Corporation Transport Department, said recently. It was apparently an extremely economic form of transport, and if people did not include the capital cost they could argue it was cheaper to travel by scooter than by bus. But taking capital cost into account, they were paying much more for their transport. Television had killed a lot of evening traffic, but as people became used to it some of the lost passengers were coming back. Traffic congestion and street parking tended to slow services. He hoped this would be borne in mind as the number of cars increased year by year.

inspired by the hardships he himself experienced as a long-distance lorry driver. The County Council had refused permission on the ground that the proposed site was intended for a green belt and that the additional traffic would probably cause road congestion. It approved the principle, said the scheme was imaginative but this was not the proper place for it and was willing to help Mr. Capstaff find an alternative site. The Minister in turning down the appeal said the proposal would be seriously detrimental to the preservation of open land.

Liverpool Hopes of Bigger Buses

DURING the last three years passengers on Liverpool Transport buses totalled 359 million, 354 million and 352 million respectively, states the annual report. Steps are to be taken to reduce services in accordance with the reduction in demand in an effort to offset loss in revenue. The general manager, Mr. W. M. Hall, states that to deal with peak-hour traffic it is felt that a smaller fleet of large-capacity vehicles would tend to reduce congestion on the roads, and experiments with the most desirable type of vehicle are being continued.

Trolleybuses at Portsmouth

PORTSMOUTH Passenger Transport Committee has accepted the findings of the consultants appointed by the council in March last to conduct an inquiry into the future of the trolleybuses, and the co-ordination agreement with Southdown Motor Services, Limited. The consultants, Harold Whitehead and Partners, Limited, find that the policy of abandoning the city's trolleybuses is sound. They find, too, that the agreement with Southdown Motor Services is satisfactory. They state that the greatest objection to trolleybuses is that they are route-bound and inflexible. The drawback might be of minor importance in a town where the pattern of transport demand, and the bus routes, were well established. In the Portsmouth area, trolleybus routes were based largely on the original tram routes, which were designed to serve a self-contained city, and could not extend beyond Cosham.

In expressing the view that the agreement between Portsmouth and Southdown should continue, the consultants point out that under section 4 of the Portsmouth Corporation Act, 1946, the two parties are given wide freedom to make such modifications of the terms as may at any time be agreed between them, and consequently it will not be necessary to draft an entirely new agreement to enable the co-ordination to be adapted to new circumstances. It is shown that the consultants discussed the matter with local interested bodies, also with the transport managers of nine other municipalities.

The Passenger Transport Committee is recommending the City Council to give effect to the report of the general manager and engineer (Mr. H. Simmonds) relating to the implementation of the first stage of the abandonment policy, which provides for certain withdrawals of services, and to instruct the general manager to submit for consideration further plans for the withdrawal or substitution of trolleybuses "as circumstances of vehicle design and traffic requirements develop."

Bus and Coach Developments

F. and M. Luxury Coaches, Limited, Birmingham, seeks the excursions and tours licensed to H. Pittaway, Mulley's Motorways, Limited, Ixworth, Bury St. Edmunds, applies for the Stowmarket—London service of Corona Coaches, Limited.

Leeds Corporation proposes a Central Bus Station—Temple Newsam bus service to replace the existing tram route and Halton—Stanningley and Cross Gates—Horsforth routes which would, inter alia, replace the Kirkgate—Halton and Kirkgate—Cross Gates tram services.

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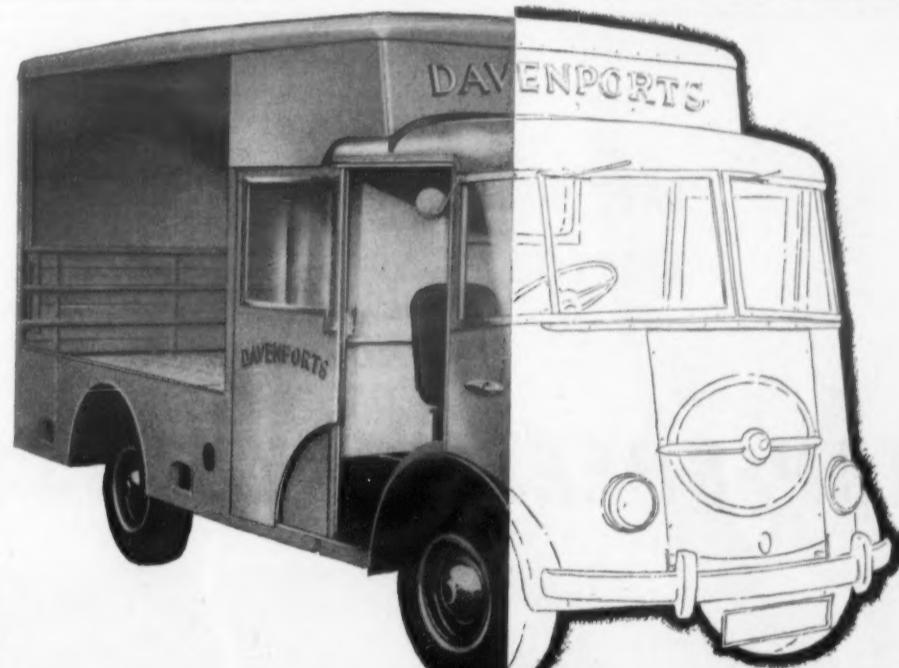
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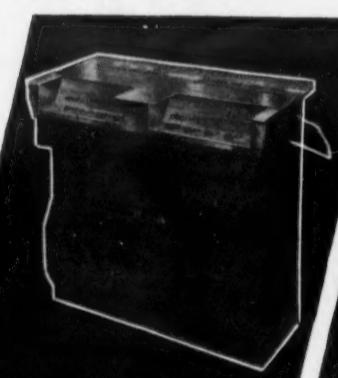
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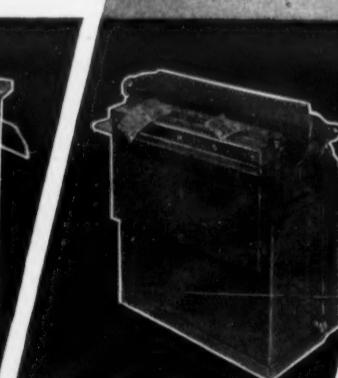
BELL PUNCH machines, four of which are shown here.

TOP SPEED TICKET ISSUE with BELL PUNCH



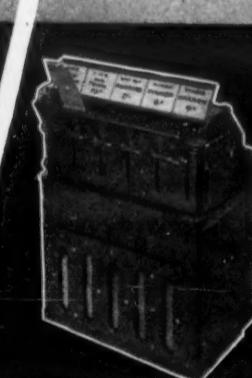
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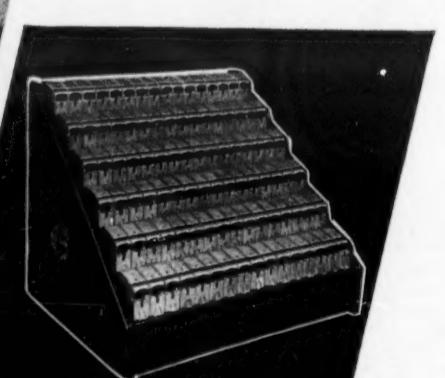
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The Railway Revolution

(Continued from page 13)

bulk traffics; to discharge by compressed air for others; to refrigerate; to carry greater weights. It is partly a problem how to transfer it between road and rail. The road-rail vehicle may be either a piggy-back one which climbs on to a railway chassis, or a true amphibian which runs with the same chassis on road or rail. In America the piggy-back is in wide use. Here, with a smaller loading-gauge, the design is difficult. The development of the amphibian is more likely. A prototype is under test.

The upshot of these two things alone or in combination will be the ability of the railways to transfer full loads between road and rail in a negligible time at a negligible cost and with no risk of damage. To safety in shunting, of which more under marshalling yards, the contribution of the designer of rolling stock is an improved buffer and coupler, the effect of which will be simply—and no more need be said—to remove the risk of damage from shunting.

Yards

Next, marshalling yards. The unit of the country's trade is less than a train load. The unit of a railway's operation is a train. Hence the device of marshalling yards for combining and dispersing the smaller units into and out of the larger. A necessary evil up to a point and that point is now several places away from where it was. Our forefathers could put no more than a thousand wagons a day into a marshalling yard of some 17 sidings. That was the reasonable limit which an engine could do shunting on the flat. As traffic grew to the point where there were 1,500 and then 5,000 wagons a day passing through a junction, there was nothing they could do but add to the one yard—and each time they did so they increased the number of wagons transferred between each of the yards, so they required still more yards.

At one such concentration with which the author was concerned a little while ago, a little less than 5,000 wagons a day entered and left the area; we shunted over 12,000, each on average 2½ times. Now techniques have advanced to the point where

we can shunt over 5,000 wagons a day in one yard. In the case quoted, 15 yards were combined in one main throughput yard and two storage yards. Through electronically controlled rail brakes damage in marshalling yards will become a thing of the past.

Terminals

On terminals there are three main streams of thought. Firstly, the basic industries whose transport costs are of so great a proportion of their selling price will continue allied more firmly than ever to rail. Their need will continue to be receipt of raw materials in and dispatch of finished products from their own siding. Where their customer also has a siding, well and good. Where their customer has not, the new techniques of road-rail transfer will accelerate and simplify the transit. Secondly, by virtue of these new vehicles the railways will no longer be tied to particular terminals. Any tarmac alongside the track will do.

Thirdly, for small consignments which must be sorted the concentration into terminals 20 or 30 miles apart will have the effects, firstly, of making mechanisation worth while with its benefits of speed and low costs; secondly, of making train loads from the terminal with benefits in speed by avoiding marshalling yards; and, thirdly, of reducing damage in handling by the use of conveyors.

To control loading, shunting and movement of trains by push-button is no idle dream—the railways ultimately, as pie in the sky, can look to automation.

The picture of railways reduced in number, but convenient, reliable, fast, safe and cheap, may seem to the reader as special pleading by a railway man. Of course it is; but let the author say two things. We tend in this country to be so objective, to be so fair to others, that we reduce everything to the average level of dullness of ditchwater. Secondly, the author has set down what the protagonists of air, water and road have said for themselves. If there is a great deal more to be said for railways, then it is because the technical advances in railways over the next fifteen years will be far greater than in other forms of transport.



Most recent London Transport single-deck service to receive lowbridge double-deck buses is from Clapton to Maryland Point. An A.E.C. RLH type is seen at Stratford on Route 178

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SOCIAL AND PERSONAL

Rural Bus Committee

MEMBERSHIP of the Committee on Rural Bus Services has now been completed. The members have been invited to serve as individuals rather than as representatives of particular organisations. The committee will therefore be well qualified from all aspects to deal with the problems of running rural bus services. The members are:

Professor D. T. Jack (chairman—already announced);
Councillor T. W. Benbow (Llandioedd);
The Hon. Dame Frances Farmer (National Federation of Women's Institutes);
Mr. C. I. R. Hutton (chartered accountant);
Mr. W. L. James (executive director, British Electric Traction Co., Limited);
Colonel A. T. Maxwell (company director);
Colonel Sir James M. Miller (past chairman, Association of County Councils in Scotland);
Mr. S. W. Nelson (chairman, Western area Traffic Commissioners);
Mr. H. R. Nicholas (assistant general secretary, T. and G.W.U.);
Mr. E. B. Powley (National Association of Parish Councils);
Lady Riddell-Webster (Association of Scottish Women's Rural Institutes);
Mr. F. W. Ward (National Farmers Union).

Terms of reference are: "To review present trends in rural bus services and in particular to inquire into the adequacy of those services; to consider possible methods of ensuring adequate services in future; and to make recommendations."

The secretary of the committee will be Mr. J. M. Moore. Bodies or persons who wish to make representations to the committee are invited to send them in writing to him at the Ministry of Transport and Civil Aviation, Berkeley Square House, London, W.1.

* * *

Mr. C. G. C. Wayne, M.Inst.T., previously general manager, Tasmanian Government Railways, has been appointed Commissioner of the Western Australian Government Railways. Mr. Wayne joined the Tasmanian Government Railways in 1949 as traffic advisory officer; he was appointed



Mr. C. G. C. Wayne



Mr. C. S. McLeod

deputy general manager in 1951 and general manager and Associate Commissioner of Transport in 1952. In the course of his career he has carried out special investigations in several overseas countries, including Ceylon, the United Kingdom and Northern Ireland, France, Switzerland, Italy, Western Germany, Belgium, the Netherlands and Canada. He was educated at the London School of Economics and the School of Oriental Studies, University of London. After graduating in transport subjects he undertook a course of training on the London and North Eastern Railway and the Chicago, Milwaukee and St. Paul Railroad. Prior to going to Tasmania Mr. Wayne served with the Nanking-Shanghai Railway, the Chinese Government Railways, and later transferred to the Buenos Aires Great Southern and Western Railways in the Argentine Republic.

Mr. W. Griffiths has been appointed district commercial officer, Swansea, Western Region, B.R., and Mr. J. Powell has become district traffic superintendent, Gloucester.

Mr. W. B. S. Miller, B.A. (Eng.) (Cantab), assistant engineer (special duties), chief civil engineer's office, York, has been made principal assistant to the general manager, North Eastern Region, B.R.

Mr. John Hay, M.P., Joint Parliamentary Secretary to the Ministry of Transport and Civil Aviation, has appointed Mr. G. S. Riddle to be his private secretary in succession to Mr. A. J. Rosenfeld.

We regret to record the sudden death of Mr. Herbert Parry, senior assistant secretary of the Transport Salaried Staffs' Association since 1953. He was 53 and was due to become assistant general secretary next month.

We record with regret the death of Mr. F. H. Parker, engineering manager of Fairey Aviation, Limited. He was 45, had served an apprenticeship with the Bristol Aeroplane Co., Limited, and joined Fairey Aviation as assistant chief engineer in 1951.

Mr. Harry Henry, director of research, McCann-Erickson Advertising, Limited, has been made managing director of Marplan, Limited, the independent marketing research and planning organisation which has been established on the foundations of the McCann-Erickson research organisation.

Mr. H. R. Roberts, manager, Sweden, British European Airways, is to become sales manager, United States. He will be succeeded by Mr. D. M. H. Russell, station superintendent, Geneva. Mr. P. A. Gillibrand, whose appointment as manager, Germany, has already been announced, took up his post on September 5.

Mr. F. L. Burton has been appointed general agent, Canadian Pacific Railway, Birmingham, in succession to Mr. A. S. Craig, who has retired after 49 years' service. Mr. H. E. W. Chapman, passenger agent, Liverpool, succeeds Mr. F. L. Burton as general agent, passenger department, London, and Mr. H. K. Williams moves to Liverpool as passenger agent there.

Mr. S. R. Hall has been made technical development officer, Eastleigh carriage and wagon engineer's office, Southern Region, B.R.

* * *

Mr. D. Beattie has been appointed district commercial manager, Leicester, London Midland Region, B.R.

* * *

Mr. A. Kitson, of Edinburgh, has been appointed general secretary of the Scottish Horse and Motormen's Association in succession to the late Mr. John Brannigan.

* * *

The development of the Liverpool-Crewe electrification falls to Mr. J. K. Lord, who has just been appointed electrical traction engineer, Liverpool, London Midland Region, B.R. He succeeds Mr. R. C. Smith, who retired recently.

* * *

A new Transport Users' Consultative Committee for Wales and Monmouthshire has been appointed by the Minister of Transport. Its chairman remains Mr. R. G. M. Street and members newly-appointed are Mr. T. Jones, representing labour, and Aldermen D. Tudor (Merionethshire) and C. A. Horwood (Cardiff) representing local authorities.

* * *

Mr. E. Watson Rodger, C.A., has been appointed managing director of the British Wagon Co., Limited, and Mr. Colin J. V. Gray has been appointed general manager and local director. Mr. B. J. Morlondo becomes assistant general manager and local director, Mr. F. W. Westcombe sales manager, and Mr. A. S. Hardinges assistant sales manager.

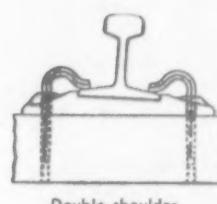
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Mr. C. S. McLeod, who has succeeded to the post of director of industrial relations, B.T.C., entered the service of the L.N.E.R. as a traffic apprentice in 1927. After experience in the chief general manager's office, he was appointed to the district goods and passenger manager's office in Dundee

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IMPORTANT CONTRACTS**Clear Ahead for the Rotodyne**

THE future of the unique Fairy Rotodyne vertical take-off air liner is now assured with the intention, announced last weekend, of the Ministry of Supply to place a contract with Fairey Aviation for the further development of the Rotodyne and the purchase of a military version of the aircraft. It was also announced that British European Airways is entering into direct negotiation with Fairey for the purchase of six Rotodynes of improved type, powered by two Rolls-Royce Tyne turboprop engines, carrying up to 70 passengers at a cruising speed of 200 m.p.h. B.E.A. might have a total requirement for 20 such aircraft, the first of which should be entering service in 1964. There is also much interest in the Rotodyne on the part of foreign airlines, some of which have stated their intention of placing orders.

New Dredger for East Coast Scottish Ports

British Transport Docks has placed an order with Seawork, Limited, London, for a twin-grab diesel hopper dredger for use mainly at the ports of Grangemouth and Methil, where over 400,000 tons of spoil have to be removed each year from the docks and their approaches. The new vessel, which will replace several obsolete craft, will have a length (B.P.) of 190 ft., a moulded breadth of 37 ft., and a carrying capacity of 1,200 cu. yd.

Marconi Sub-Miniature ADF in Civil Aircraft

Marconi's Wireless Telegraph Company announces further sales of its Type AD722 sub-miniature radio compass. One recent order, from the Italian Air Force, is for 25 sets for use in Fiat G91 jet fighter aircraft. Another from Central African Airways is for a dual installation for each of five DC3 passenger aircraft, indicating the suitability of the AD722 for use in larger aircraft. The equipment is widely used by the Royal Air Force, for which it was initially designed, and by a number of Commonwealth air forces.

Polish Order for Marconi Marine Equipment

The Marconi International Marine Communication Co., Limited, announces the successful conclusion of negotiations with the Polish organisation CENTROMOR (Central Import and Export Office for Ships and Marine Equipment) as a result of which Marconi Marine has received an order for over £100,000 worth of marine radio equipment. Transmitters, receivers, direction-finders, echo-meters and other equipment will be supplied to provide complete radio installations for 24 ships to be built in Polish shipyards for delivery to Indonesian owners.

U.S. Diesels for U.A.R.

A \$12 million credit to finance the purchase in the United States by the Government of the United Arab Republic of 58 diesel-electric locomotives, with spare parts and shop tools, was announced recently by the Export-Import Bank. The credit, which will assist the United Arab Republic Railways to carry forward their current dieselisation programme, will be repaid over a period of five years, commencing in November, 1960. Dieselisation was begun soon after the 1939-45 war. Because of the considerable

economies realised through diesel operation, it is now the policy of the railway to replace its remaining steam locomotives with diesels. In connection with its sale of the 58 locomotives, General Motors Overseas Corporation will send several of its technicians to the United Arab Republic to augment existing training facilities.

Eastern Region Contracts

The Eastern Region of British Railways announces the following contracts:

Clyde Crane and Booth, Limited, Redley, for two 10-ton, three-ton and five 3-ton level-lifting portal jib cranes. S. H. Heywood and Co. Limited, Manchester, 3, for electrical installation at Wath marshalling yard.

Clough, Smith and Co. Limited, Crawley, for installation of switchgear, transformer and cables for substation D at Stratford diesel depot, and for electrical installation for new diesel maintenance depot and amenities block at Finsbury Park.

More Gardner Diesels for Hong Kong

Norris, Henty and Gardners, Limited, has received further orders for 15 five-cylinder vertical LW and 15 five-cylinder horizontal HLW diesel engines for powering respectively Guy Mark IV Arabs underfloor bus chassis for the China Motor Bus Company. This brings the total of Gardner-engined vehicles operating in Hong Kong and Kowloon territories to about 580 vehicles.

Second Section of Bornu Extension

The Nigerian Railway Corporation has awarded a contract to Strabag (Nigeria), Limited-Hochte AG-Philipp Holzman AG, for the construction of the second section of the Bornu Extension from Bauchi to Gombe, a distance of about 100 miles. The contract covers the construction of the formation, bridges, culverts and ancillary works, and their maintenance for an agreed period at a cost of approximately £1,767,000. The work will start very shortly and is expected to be completed by the end of 1961.

T.C.A. Orders Computer Booking System

For use in its modern seat reservation system, which is expected to begin operation in 1961, Trans-Canada Air Lines has ordered a transistorised computer system from Ferranti-Packard Electric, Limited, Toronto, the wholly owned Canadian subsidiary of Ferranti, Limited, Hollinwood, Lancs. Earlier this year, T.C.A. placed a \$2 million order with Ferranti-Packard for booking office and communications equipment for use in conjunction with the central computer. This latest order brings the total cost of the system, which we described in our issue of August 16, 1958, to nearly \$3½ million.

Multi-Spot Welding Machines

Multi-spot welding machines supplied by Electro Mech-Heat, Limited, Kingston-on-Thames, now in operation at the Birmingham works of Fisher and Ludlow, Limited, are playing an important part in high-speed assembly of the B.M.C.'s new Austin Seven, production of which is expected to reach a peak of over 3,000 a week. Specialised equipment enabling a large number of high-quality spot welds to be made simultaneously, incorporating locating and jigging fixtures and air-operated ejection mechanisms to ensure a high degree of accuracy and dispatch, has been supplied.

St. Lawrence Seaway Traffic

An increase of about 75 per cent in cargo tonnage taken up the St. Lawrence Seaway so far this year is reported by the Seaway Authority. Since the navigation season opened in April until the

TANK tests have been carried out by Saunders-Roe at Cowes, I.O.W., on models of a nuclear-powered underwater cargo carrier being evolved by Mr. F. G. Mitchell, head of the civil engineering contractors, and a Saunders-Roe scientist. Development has reached the stage where a 28,000 net-ton vessel having a displacement of 50,000 tons is envisaged. Iron ore from the northern shores of Canada would be her cargo. The reactor would be of the boiling water class located right aft, the crew being accommodated forward in the cigar-shaped vessel.

Japanese Pooling on U.S. Service

NINE Japanese shipping lines operating cargo services between Japan and New York have signed a grouping agreement. Under the agreement, the nine firms forming three groups would take co-ordinated actions for freighter pooling and shipping arrangements, in order to end excessive competition among themselves.

Trade on Shannon

ESTABLISHED about 15 months ago to develop an entrepot trade on the Shannon, Shannon Estuary, Limited, is now in a position to place detailed proposals before the Eire Minister of Transport, it is reported. Transhipment of oil and general cargoes would be handled initially; later, local industry might be attracted.

Encouragement at Middlesbrough

EVIDENCE that the corner was being turned was referred to by Colonel T. Eustace Smith, chairman of the Tees Conservancy Commission, at Middlesbrough on September 7. The meeting of the commissioners was told that in July, 296 vessels entered the port, 11 fewer than last year, but the net registered tonnage rose from 471,778 to 529,794. Imports were 478,021 tons against 381,866, and exports 116,146 tons against 133,940. Revenue was £51,317 compared with £44,015 in July, 1958.

French Orders

SEVERAL large orders have recently been placed with number of French yards, the largest being for two oil tankers of 53,050 deadweight tons, to be built by Chantiers de l'Atlantique Penhoët-Loire for National Iranian Tanker Company. Dimensions and tonnage of both will be comparable to the four oil tankers of which two were delivered, by Chantiers de l'Atlantique and Chantiers de France respectively, to the American Tidewater Oil Associates Company in 1956. The recent order brings the total number of oil tankers in the 34,000-73,000 ton range which have been built or are on order at St. Nazaire to 14. Forges et Chantiers de la Méditerranée received an order from two British shipowners for four diesel freighters of 13,700 deadweight tons not long ago, and have already entered an additional order for a fifth vessel of this type.

September 23—Australia

Victorian Railways for 800 shock absorbers for suburban train bogies. Photocopies of tender documents from Export Services Branch, B.O.T., price 4s. (ESB/21377/59).